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Number 5.

FEBRUARY, 1905.

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$3.00 with Directory.

TEXTILE WORLD RECORD

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Table of Contents
Page 61

Index to Advertisements
Page 193

Buyers' Index
Page 183

LORD & NAGLE COMPANY · Boston & Philadelphia

COPYRIGHT, 1904, LORD & NAGLE COMPANY.

The Textile-Finishing Machinery Co.

17 EXCHANGE PLACE, PROVIDENCE, R. I.

Mercerizing Machinery for Piece Goods and Yarn in the Warp or Chain

Singeing Machines,

Boiling Kiers,

Washers, Squeezers,

Chemic and Sour

Rusden Patent

Continuous Chainless

Steamer,

Aniline Agers,

Dyeing Machines,

Open Soapers,

Blanket Washers,

Color Kettles,

Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

Dampening Machines,

Dyeing Machines for Chain Warps.

BUILDERS OF ALL KINDS OF

MACHINERY

FOR

BLEACHING
DYEING
DRYING

AND

FINISHING

Calenders for Rolling, Glazing, Chasing and Embossing, also Callenders for Moire Finish.

Sole Manufacturers of Patented Flexible Cloth Expander for Cylinder Drying Machines, Calenders, Mangles, &c.

Patent Combination Rolls Made of Cotton and Husk, especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

Padding and Drying Machines for Shade Cloths.

Single and Double Cylinder Engines.

Hydraulic Presses and Pumps.

ALL KINDS OF OUTFITS FOR BLEACHING THREAD AND SOFT TWISTED YARN.
BLEACHING MACHINERY FOR YARNS IN THE WARP OR CHAIN.

Estimates, Drawings and full particulars of complete plants furnished on application

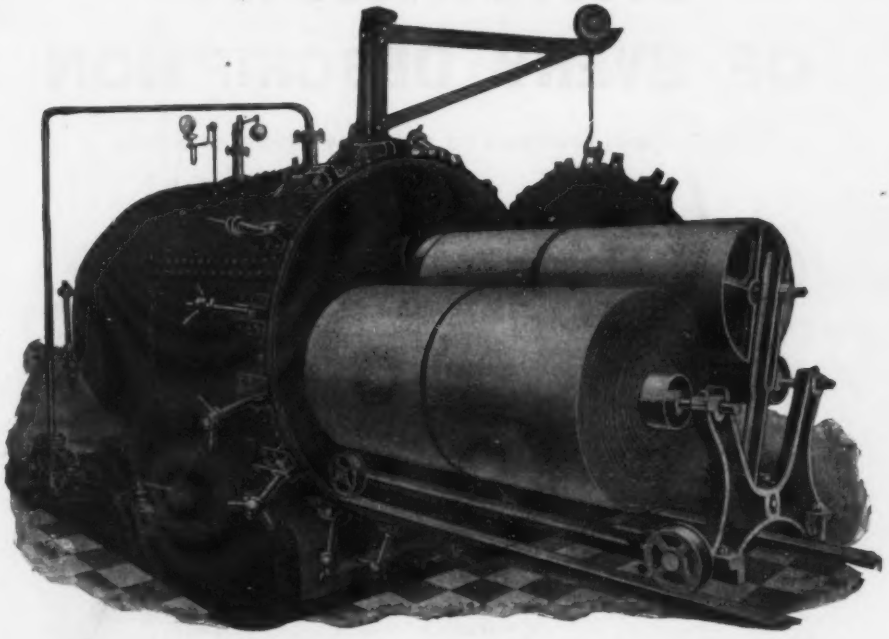
Southern Agent, STUART W. CRAMER, Trust Bldg., Charlotte, N. C., Equitable Bldg., Atlanta, Ga.

Open Bleaching System

OF

JACKSON & HUNT

Patented in the United States, Great Britain and the Continent
U. S. Patent, January 15th, 1901. No. 666,056



H. W. Butterworth & Sons Co.

Manufacturers of

Bleaching, Dyeing, Drying and Finishing Machinery

YORK AND CEDAR STREETS

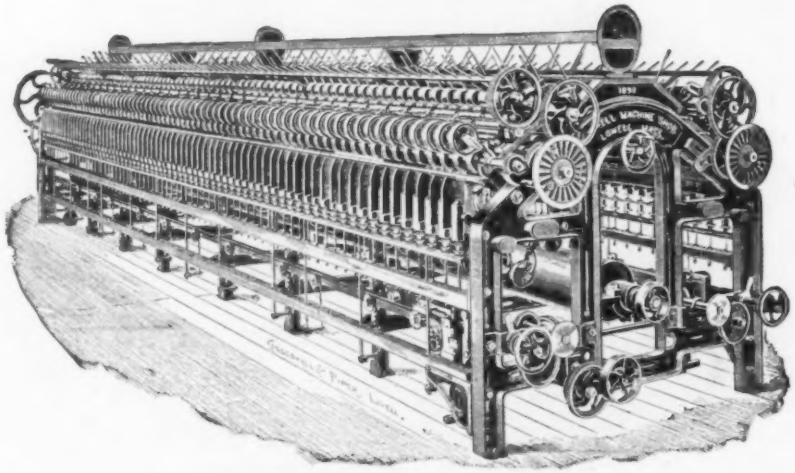
PHILADELPHIA

Sole Makers for the United States

AMERICAN WORSTED MACHINERY

OF EVERY DESCRIPTION

with modifications to suit any class of work.



WORSTED CAP SPINNING FRAME.

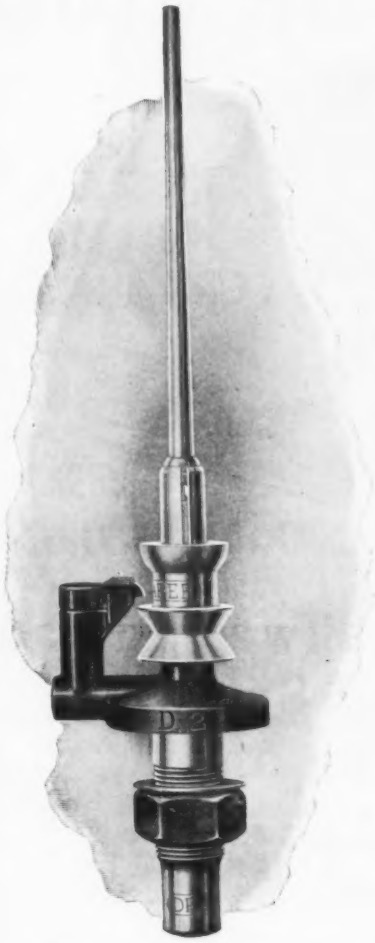
Flyer and Ring Spinning Frames, Dandy Rovers and Reducers, Cone Second Finishers, Reducers and Rovers, Cill Boxes for Drawing, Preparing and Finishing, Weigh Boxes and Drawing Boxes, Cap Trap, Flyer and Ring Twisters.

Specifications and Estimates Furnished Upon Application.

LOWELL MACHINE SHOP

LOWELL, MASS.

A New Spindle Improvement



The Rabbeth Centrifugal Bobbin Clutch.

Fits the Bobbin loosely when at rest—allows considerable variation in fit.

Bobbins will all go down into place and Traverse can be lengthened.

Allows easier and quicker doffing — stronger bobbins — less reaming.

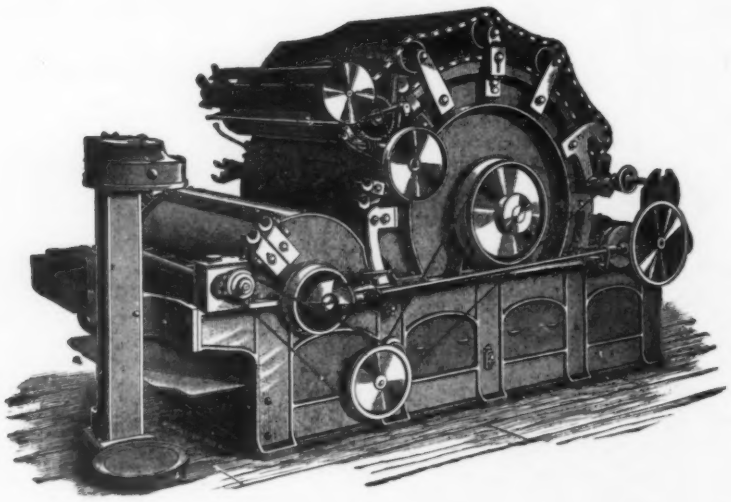
Draper Company, Hopedale, Mass.

We Also Build Looms.

MASON MACHINE WORKS,

TAUNTON, MASS.

Cotton Machinery



Cards, Combers, Railway Heads,
Drawing Frames, Spinning
Frames, Mules and
Looms,

INCLUDING

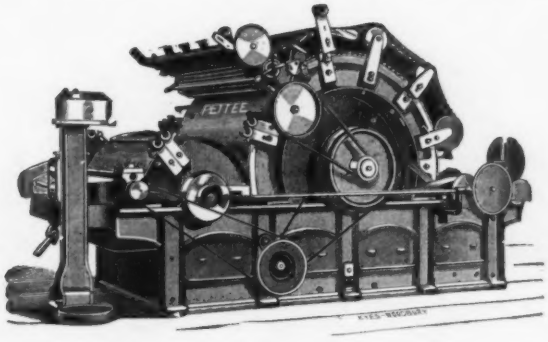
Plain and Fancy Silk Looms

Southern Office, Charlotte, S. C.

Saco and Pettee Machine Shops

NEWTON UPPER FALLS, MASS., U. S. A.

COTTON MACHINERY



PICKERS,
REVOLVING FLAT CARDS,
DRAWING FRAMES,
RAILWAY HEADS,

SLUBBING,
INTERMEDIATE AND ROVING FRAMES,
SPINNING FRAMES,

SPOOLERS AND REELS.

Shops: { **Biddeford, Me.**
Newton Upper Falls, Mass.

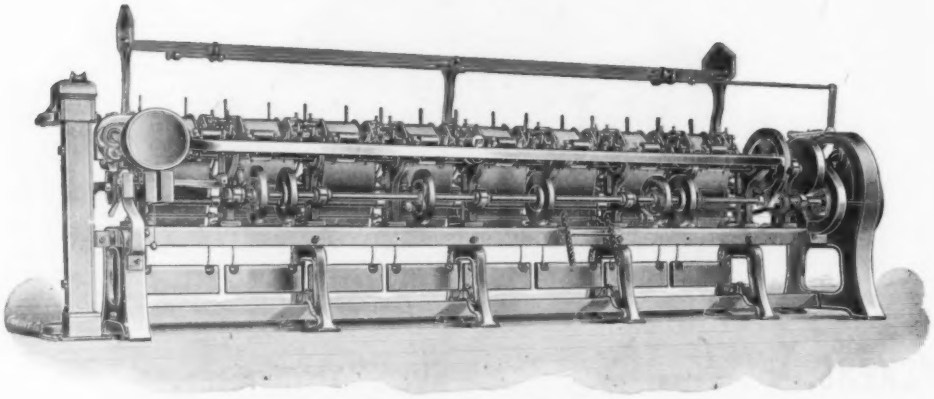
Southern Agent, A. H. WASHBURN, Charlotte, N. C.

THE

WHITIN MACHINE WORKS,

Cotton Machinery

WHITINSVILLE, MASS.



The Whitin 8 Head Comber.

Southern Agent, . . . S. W. CRAMER

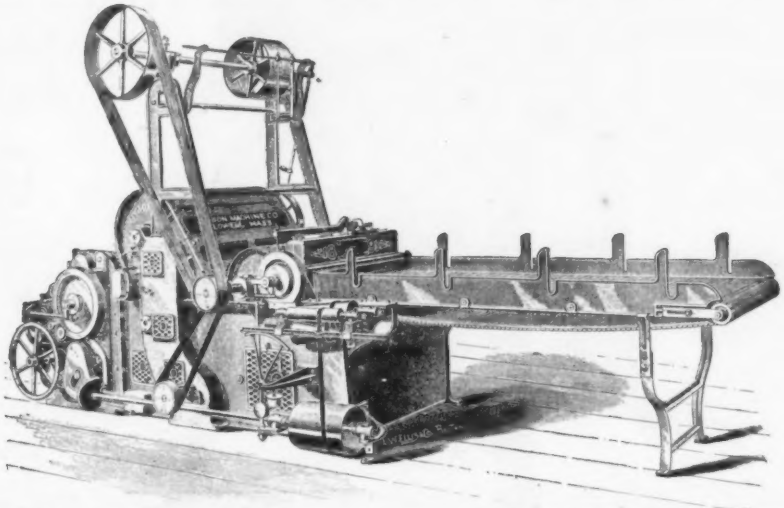
Trust Building, CHARLOTTE, N. C.
and Equitable Bldg, ATLANTA, GA.

Revolving Flat Carding Engines,
Sliver Lap Machines,
Ribbon Lap Machines,
Combers,
Railway Heads,
Drawing Frames,

Spinning Frames,
Spoolers,
Twisters,
Reels,
Looms,
Long Chain Quilling Machines.

The Best Pickers

In the Cotton Field nothing equals the DARKY COTTON PICKERS.



In the Cotton Mill nothing equals the KITSON COTTON PICKERS.

KITSON MACHINE CO., LOWELL, MASS.

LARGEST BUILDERS OF COTTON OPENERS AND LAPPERS IN THE WORLD.

STUART W. CRAMER, Southern Agt., Charlotte, N. C. and Equitable Bldg., Atlanta, Ga.

SCOTT & WILLIAMS

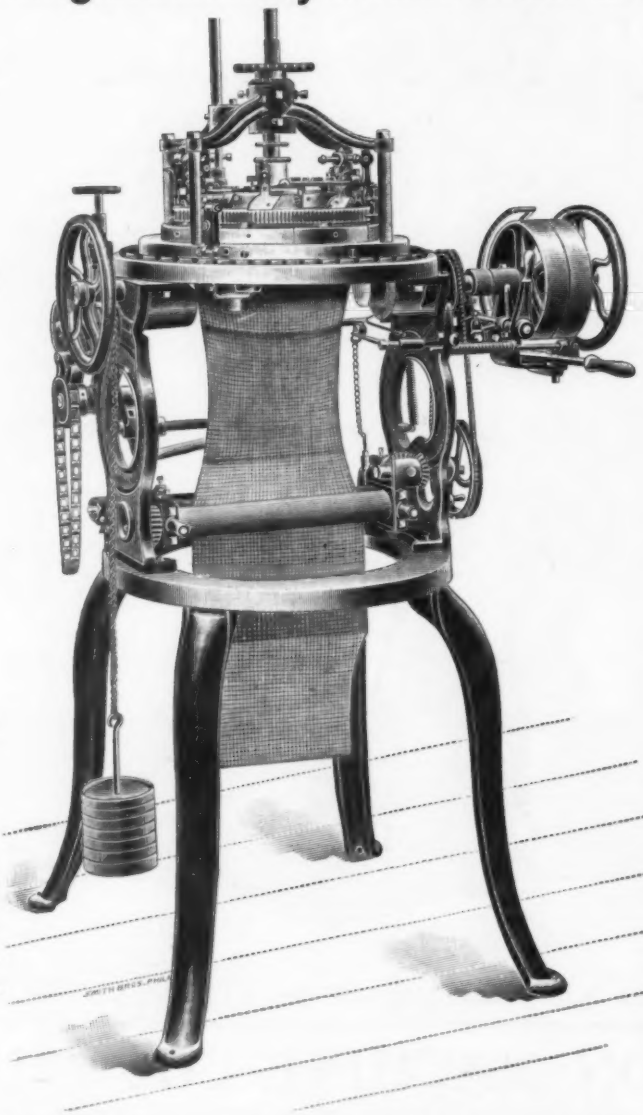
BUILDERS OF

Rib Knitting Machinery for Underwear and Hosiery

The illustration shows our

Improved High Speed Single Lever Automatic Ribbed Underwear Machine

for making ladies' and gents' ribbed underwear, union suits, etc., plain and shaped.



Plain, Single Lever or with Welt, Slack Course and Automatic Slackening Device for Welt.

Improved Measuring Device, by actual length knit.

Sizes, 8 to 24 inches, inclusive, varying by one inch.

Number of Feeds, four to 12, according to style and diameter of machine.

Solid Forged Steel Cylinders, specially hardened or with patent inserted walls for fine fabric.

Special Machinery for Sweaters etc.

We build Loopers, Ribbers and other Machinery for Knitting Mills

As well as

A Complete Line of Full Antomatic and 7-8 Automatic Seamless Hosiery Machinery.

Full Particulars, Samples and Special Catalogues on Application.

2079 E. Cumberland Street, Philadelphia, Pa., U. S. A.

BRANSON MACHINE CO.

BUILDERS OF

KNITTING MACHINERY

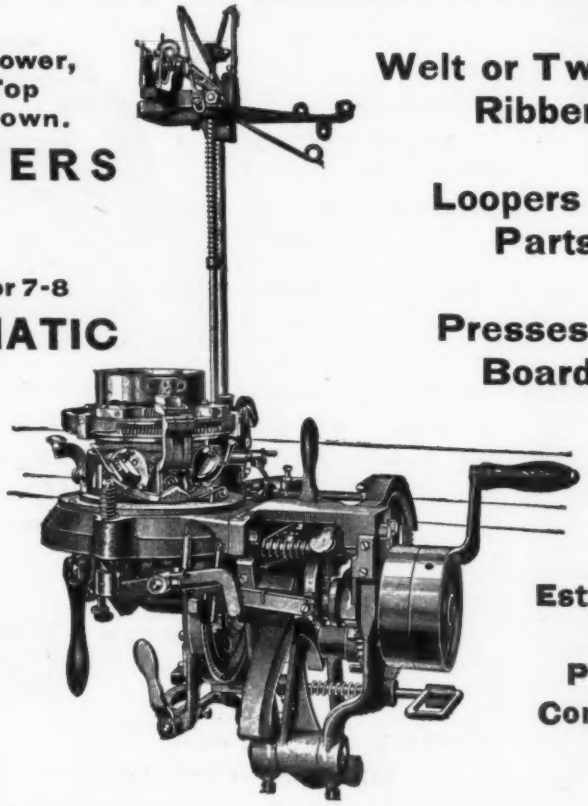
Hand or Power, Open Top or Hold Down.

KNITTERS

1-2, 3-4 or 7-8

AUTOMATIC KNIT-TERS

All Sizes and All Cauges.



Welt or Two-Feed Ribbers.

Loopers and Parts.

Presses and Boards.

Estimates for Plants Complete.

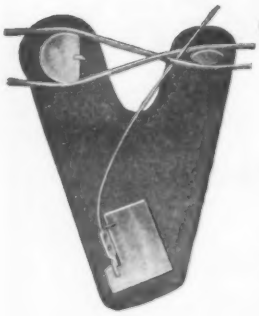
Winders and Bobbins. Hand Forged Steel Cylinders.

BRANSON MACHINE CO.

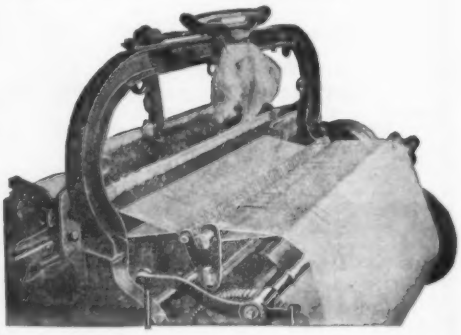
504 North American Street, : : Philadelphia, Pa.

Write for Information and Catalogue.

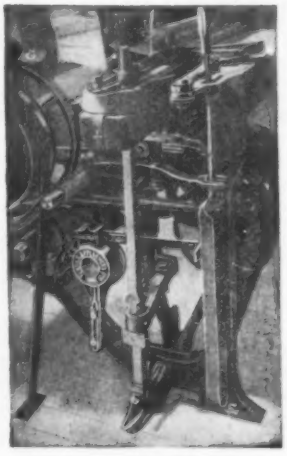
Absolute Efficiency from Bed-Rock Simplicity



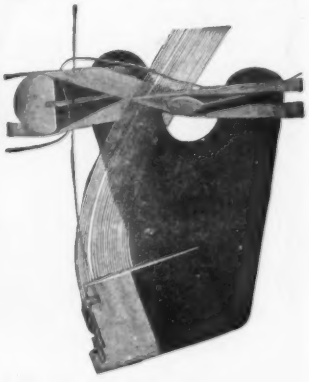
Our **WARP-STOP** controls
TWO threads by ONE spring WIRE, held in a COMB,
engaging the warp
in such a way that
the TENSION is
UNDER CONTROL,
and
ABRASION of the
yarn is AVOIDED.



The COMBS are RAPIDLY INSERTED, BEFORE or AFTER the warp is in the loom, and are carried in a bar suspended from **the LEASE-RODS** which **ARE NOT FIXED** to the loom side, but **FREE to take their proper positions,** and **ALLOW the NATURAL MOVEMENT of the WARP,** so that **the COVER of the cloth is UNAFFECTED.**



When a thread breaks the WIRE SPRINGS OUT from the comb, thus giving
a CLEAR SIGNAL of the place
of the BROKEN END,
and, by striking
a CONTACT SLIP upon which
LINT CANNOT COLLECT,
closes the circuit through
a PERFECT KNOCK-OFF, EASILY and RAPIDLY FIXED, and **actuated by a SPARKLESS current.**



TEXTILE APPLIANCES, LIMITED,
PROVIDENCE, R. I.

EVAN ARTHUR LEIGH

232 Summer Street (opposite the South Station), Boston, Mass.

SOLE AGENT IN THE UNITED STATES AND CANADA FOR

Platt Bros. & Co., Ltd.

BY FAR THE LARGEST MAKERS IN THE WORLD OF

Cotton, Woolen and Worsted Machinery

Platt's Patent Opening and Picking Machinery.
Platt's Cotton Comber will comb from 7-8″ stock to Sea Islands.
Platt's Special Machinery for Making Cotton Waste into Yarns.
Platt's Special Machinery for Making French Worsted Yarns.
Platt's Woolen and Worsted Carding Engines, Special Designs.
Platt's Cotton, Cotton Waste, Woolen and Worsted Mules.

MATHER & PLATT, LTD.

Dyeing and Finishing Machinery. Archbutt-Deeley System for purifying and softening water.

TEXTILE MACHINERY ASSOCIATION, LTD.

Flax, Hemp and Jute Machinery.

THE PATENT AUTOMATIC FEEDING MACH. CO., LTD.

Patent Feeding Machines for wool, cotton, flax, fur and fibrous material

GEORGE HODGSON, LTD.

Looms for Worsteds, etc.

JOSEPH SYKES BROS., Card Clothing for Cotton.

JAMES CRITCHLEY & SON'S, Card Clothing for Woolen and Worsted.

DRONSFIELD BROS'. Grinding Machinery and Emery Filleting.
The Best French and English Combing and Rubbing Aprons.
Harding's Pins and Circles, Varey's Fallers, etc.

Industrial Railways
Steel Cars for Industrial Railways
Steel Tanks and Hoppers
Steel Casings
Clutches — Friction, Square and Spiral Jaw
Coal and Coke Crushers
Revolving Screens for Coal, Coke, Sand, Phosphate, etc.
Coal Chutes and Gates
Angle, Channel and Beam Work
Weigh Boxes
Measuring and Mixing Machines
Skip Hoists
Screw Conveyor
Renold Silent Chain
Power Transmissions
Retail and Wholesale Coal Pockets
Locomotive Coal, Ashes and Sand Stations
Corrugated Iron Work
Vessel Loading and Unloading Machinery
Belt Conveyors
Coal and Ashes Handling Machinery
Reciprocating Conveyors
Reciprocating Feeders
Chain
Elevators and Conveyors
Sprocket and Traction Wheels.

The "Link-Belt" part of our name does not suggest the above list, but does lead you to infer that our business depends solely upon the genuine "Ewart" and perhaps some other chains, and that when building Elevating and Conveying Machinery we adhere strictly to chain.

We wish to correct the wrong impression that our descriptive name gives, aud so state :—

First—Chain represents the small end of our business.

Second—We are every day estimating on and furnishing work in the above and kindred lines.

Third—We have a thoroughly well-equipped wrought and structural steel department.

Fourth—There is no universal elevator or conveyor, and we furnish that which best solves the problem presented.

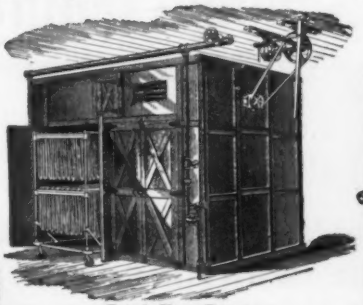
The LINK-BELT ENGINEERING COMPANY,
PHILADELPHIA

NEW YORK, 49 Dey Street PITTSBURG, 1501 Park Building

THE LINK BELT MACHINERY COMPANY, CHICAGO

"HURRICANE" DRYERS AND FANS

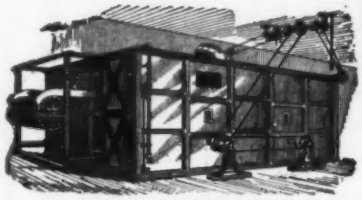
For WOOL, COTTON STOCK, YARN, STOCKINGS, UNDERWEAR, Etc.



Truck Yarn Dryer.

Write for Booklets.

"Hurricane" Fan, Style No. 2.



Cotton Stock and Wool Dryer.

CARBONIZING, BLEACHING, OXIDIZING, CHROMING and WASHING MACHINERY.

PHILADELPHIA DRYING MACHINERY CO.

6721 Germantown Ave., Philadelphia, Pa.

HOUGHTON'S ALL STEEL THREAD BOARD

with Hardened Thread Guides.

PRICE.

Steel Thread Boards, 7½ c. per Sp.
Brass " " 15 c. " "
(f.o.b. Worcester.)

Add 3 c. each for Metal Rail.

PATENTED.

Nov. 30, 1897. Nov. 9, 1901.
Mar. 8, 1898. June 9, 1903.
July 1, 1901. Mar. 1, 1904.
May 10, 1904.

and other patents pending.

Any infringements of the above Patents will pe prosecuted.

(Our Latest Model Hinge and Steel Rail.)

The only Thread Board that *holds a guide solid* all the time; *never* gets loose; is always in perfect adjustment, and thus must make a saving in travelers, broken ends, waste, thread guide, care and also prolong the wear of rings and increase the production per spindle. These claims are based on the truth of mechanical principles, and have been proven true by actual use in many mills whose superintendents will substantiate these claims. Write for list of mills using our Thread Boards.

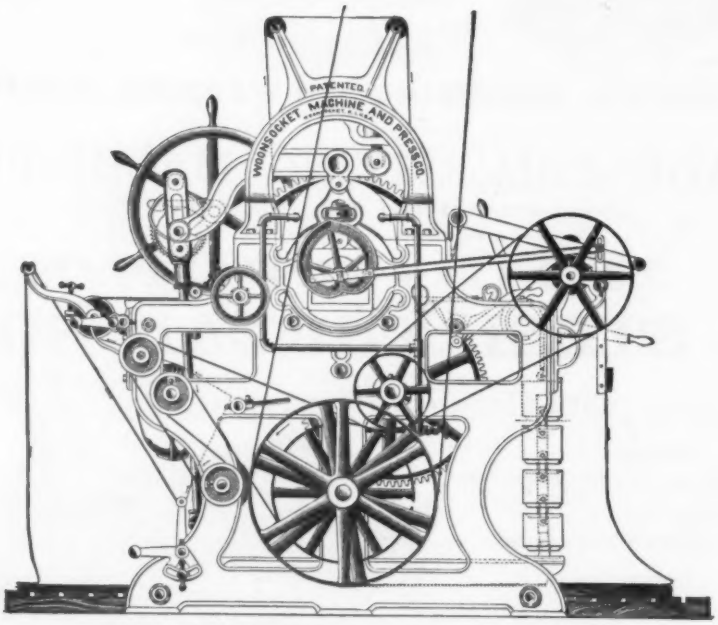
L. T. HOUGHTON, Sole Manufacturer, WORCESTER, MASS.

Best Patent Steam Rotary Cloth Press

Four Separate Pressings In One Machine!

The Only Press that has Self-Yielding Beds with Four Points of Contact

PERFECT TEMPERATURE, POWERFUL, SIMPLE

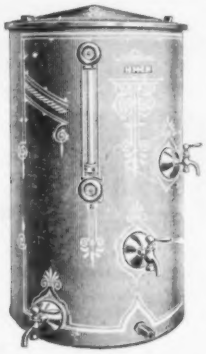


THE WOONSOCKET ROTARY PRESS.

Woonsocket Machine and Press Company

WOONSOCKET, R. I,

The Name Cross Oil Filter



is held by true economists to mean all that is true economy in the operation of a plant.

One-half the Cost of Oil Can Be Saved

by its use. Sent everywhere on thirty days approval.

"With the Cross Oil Filter we waste no oil except that which is unavoidably lost by splashing." — The Wellman-Seaver Morgan Engineering Company, Cleveland, Ohio.

The Burt Exhaust Head

even under the severest strain

Stands the Test.

It is the strongest, most durable, safest and most reliable head on the market.

It prevents water and oil escaping from the exhaust pipe. Sent on approval.

"The Burt Exhaust Head serves its purpose admirably and is giving entire satisfaction."—The Edison Storage Battery Co., Glen Ridge, N. J.

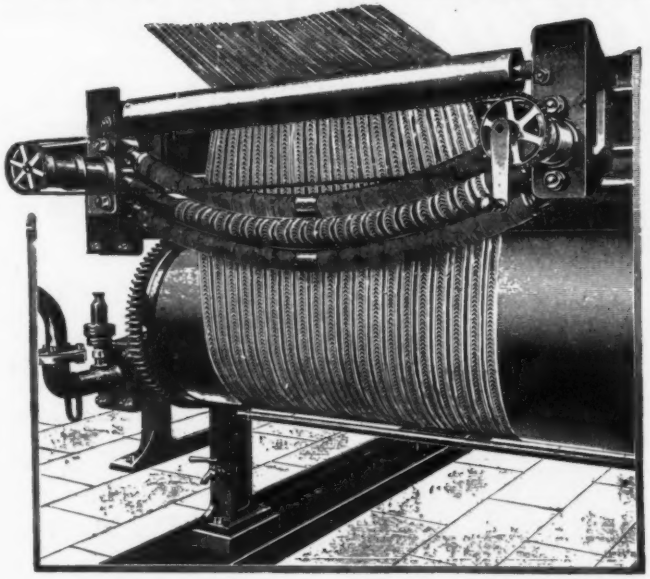
The BURT MFG. CO.,

LARGEST MANUFACTURERS OF OIL FILTERS IN THE WORLD.

214 Main St., AKRON, OHIO, U. S. A.

ALSO SUPPLIED BY OIL COMPANIES, DEALERS AND POWER CONTRACTORS.

A PERFECT CLOTH EXPANDER



The recent invention of Wm. Mycock, an English cotton manufacturer. Hundreds sold in Great Britian and on the Continent. Large bleacheries in this country where it has been placed on trial are delighted with it. Gets the full width of goods, with perfectly even tension both ways. Can be attached to calenders or cans. Put it on trial.

Patented in United States, Canada, Great Britain and Continental countries. Infringements will be prosecuted.

THOMAS LEYLAND & CO., 53 INDIA ST., BOSTON

Sole Agents for the United States and Canada.

NOT ONLY
THE LATEST
BUT ALSO THE
SIMPLEST and BEST.

THE CAMLESS WINDER.

For Cones and Tubes.

Send for Descriptive Circular.

The A. T. ATHERTON MACHINE CO.

PAWTUCKET, R. I.

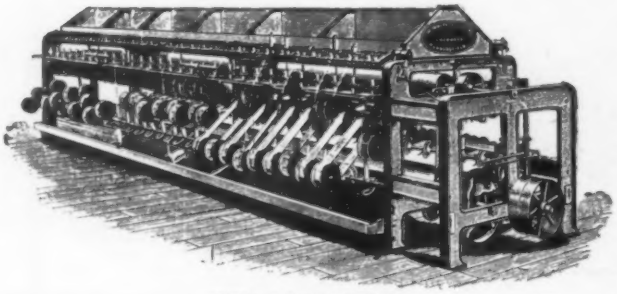
Telegraphic Address: "WHITELEY, HUDDERSFIELD." Nat. Telephone, 598 and 599.

Wm. Whiteley & Sons Ltd.

LOCKWOOD, HUDDERSFIELD.

MANUFACTURERS OF

Woolen Machinery



CONE PIRN WINDER.

Makers of all descriptions of Tentering and Drying Machines.

Moore & Whiteley's Patent Wool and Cotton Dryer.

Crabbing or Winding-on Frames.

Cross Raising Machines, Wool Scouring Machines,

Hydro Extractors. Warp Sizing.

Cool Air Drying and Beaming Machines.

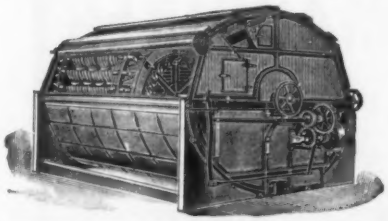
Warping Mills with Patent Sectional Dividing Apparatus.

Self-Acting Mules. Bobbin or Pirn Winder, &c., &c.

Mercerizing Machinery.

Second-hand Tentering Machines in good repair at low prices.

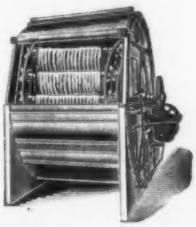
SKEIN AND SLUBBING MACHINES



SAVES

75% in Labor.
30% in Winding.
Steam and Dye Stuffs.
No Friction.
No Tangling.

CAPACITY
50 to 700 lbs per batch.



THE KLAUDER-WELDON DYEING MACHINE CO.

AMSTERDAM, N. Y.

Builders of Machines

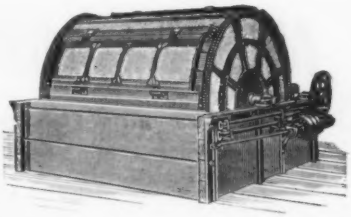
For Skein—Worsted, Slubbing, Cotton and Silk.
" " and Warp Mercerizing.
" Raw Stock Cotton, Wool, Waste and Rags.
" Garments Underwear, Hosiery and Caps
" Sulphur Colors—Raw Stock, Skein and Hosiery.

RAW WOOL AND COTTON MACHINES.

CAPACITY
200 to 1000 lbs per batch.

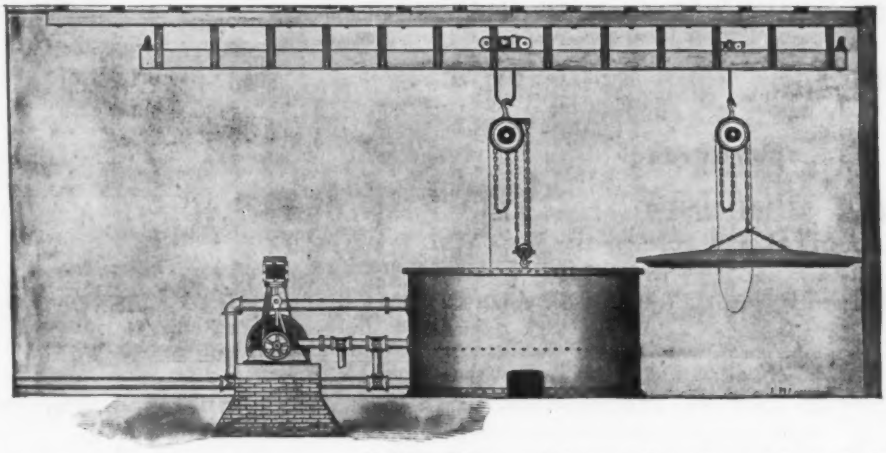
SAVES

50% in Labor besides Steam and Dye Stuffs. Practically indestructible. Leaves stock in perfect condition.



VACUUM DYEING MACHINE CO., CHATTANOOGA, TENN.

RAW STOCK, YARN AND HOSIERY DYEING MACHINES



OFFICE OF TREMONT & SUFFOLK MILLS, LOWELL, MASS., Jan. 14, 1904.

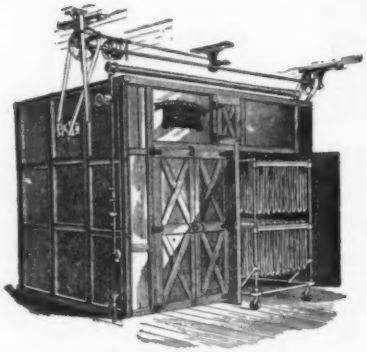
VACUUM DYEING MACHINE CO., Chattanooga, Tenn.

GENTLEMEN: Replying to your inquiry in regard to what we think of your Raw Stock Dyeing Machine, would state that we have been using one about six months, with very satisfactory results, the dyeing being level, and the stock left in first-class condition for spinning. Can give your machine no better recommendation than to say, we think so well of it that we have just placed an order for two additional machines.

Yours truly J. J. CONNELL, Agent.

"20th CENTURY" MACHINERY

DRYERS
for
WOOL,
COTTON STOCK,
YARN, STOCKINGS,
UNDERWEAR.
VENTILATING FANS.
MACHINERY
for
CARBONIZING
and
YARN SCOURING.



TRUCK YARN DRYER.

CLOTH WASHERS
and
CLOTH DYEING MACHINES, BLEACHING MACHINERY FOR KNIT GOODS, ETC.
CONTINUOUS SYSTEM FOR BLEACHING COTTON STOCK.
TOM-TOMS,
CHROMING, WASHING
and
OXIDIZING MACHINES.

AMERICAN DRYING MACHINERY COMPANY,

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Fairbairn Lawson Combe Barbour, Ltd.

LAWSON BRANCH,

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MAKERS OF MACHINERY FOR

PREPARING AND SPINNING FLAX, HEMP, TOW AND JUTE

AND OF

Special Machinery for the Manufacture of Twines,

ALSO OF

GOOD'S COMBINED HACKLING AND SPREADING MACHINE,
LONG REACH SCREW-GILL DRAWING FRAMES,
CHAIN-GILL DRAWING FRAMES with Apron Head,
PATENT HIGH-SPEED HORIZONTAL AND AUTOMATIC SPINNING FRAMES FOR MANILLA,
AND OTHER
Special Machinery for the manufacture of Rope Yarns and Binder Twine.

IMPROVED LAYING MACHINES. HASKELL-DAWES TUBING TWISTERS
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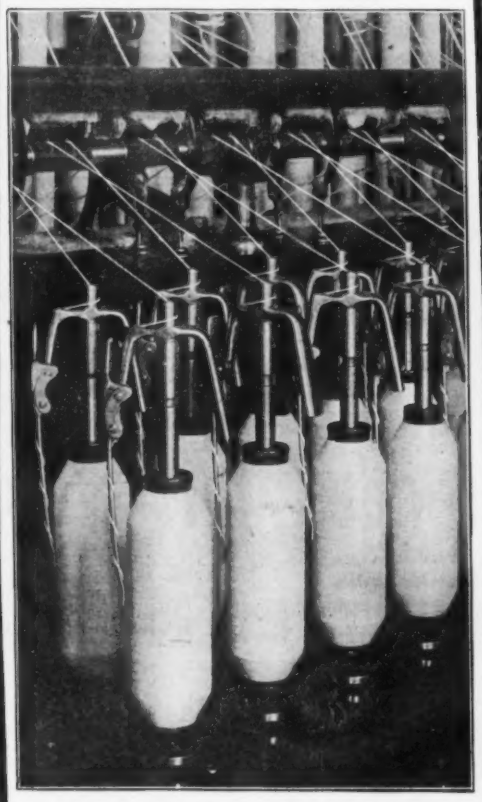
Complete Plans and Estimates for Flax, Tow, Hemp and Jute Mills, Trawl Twine Factories and Steam Ropeworks.

THE DUNN FLYER

Presents new principles and methods in Flyer construction that have proved their value and made its use of marked advantage.



3½ Inch Diameter Bobbins

are built with 7x3 Dunn Flyers on 4½" space frame with the further advantage of being able to run as fine as 15 hank roving on same flyers. Further information may be promptly obtained by addressing the

TEXTILE MACHINERY COMPANY

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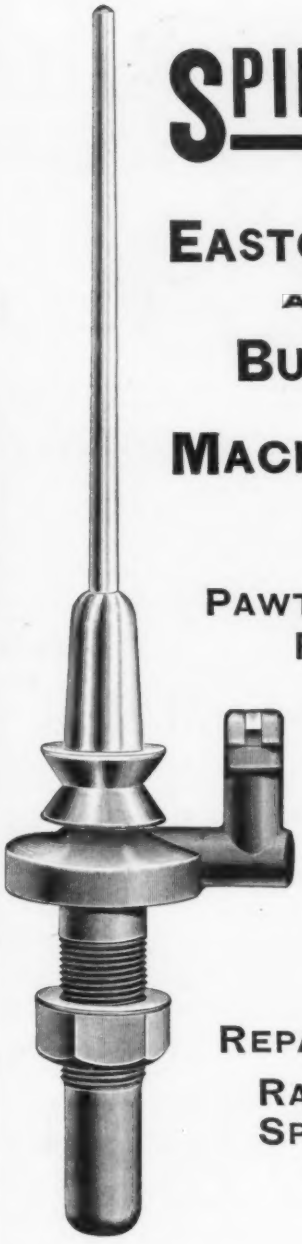
SPINDLES



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"THE REEVES" Iron Center Wood Rim Pulley

is unequalled by anything on the market for textile mill and dynamo service. It possesses all the good features of both wood and iron pulleys—solidity at the hub, minimum air disturbance and a wooden belt surface. The arm extends into and is built up with the rim forming a part of same. It will pay you to investigate.

Write for Catalogue and Prices.

REEVES PULLEY CO.,
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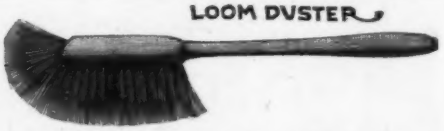
An Essential to the Weave Room



WE ARE HEADQUARTERS
S. A. FELTON & SON CO. MANCHESTER, N.H. The Loom Duster

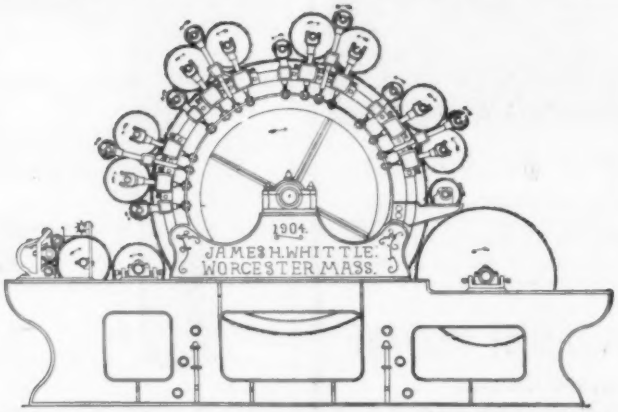
HENDERSON'S
Double Carding Process for Wool

(Patented May 10, 1904)
Is a Great Success.

Manufactured By **JAMES H. WHITTLE,** 150 Harlow St., Worcester, Mass.

INCREASES PRODUCTION AND QUALITY

SAVES LABOR



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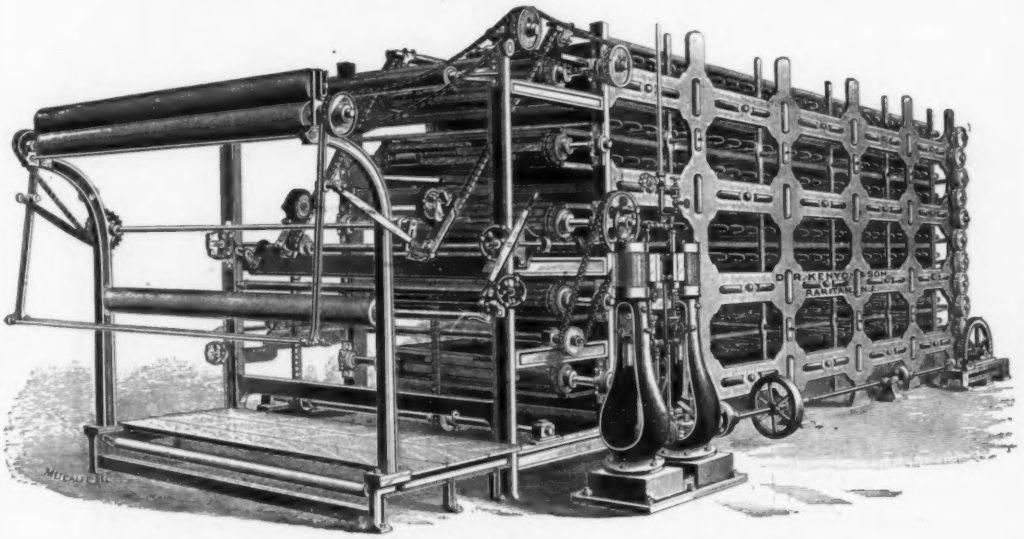
WOOL AND WORSTED MACHINERY

Including Carding Machinery for Wool and Worsted, Yarn Twisters, with or without Novelty Attachments, Yarn Dressers, Reels, Beamers, Single or Double. Yarn Spoolers, Dresser Creels, Cloth Dryers, of all widths, New Rotating Skein Dryers, Four and Eight Drum Spoolers, Improved Hydro Extractors, Improved Dusters with Fan, New Pattern Mixing Picker, Skein Drying Reels, etc.

Tentering and Drying Machines

WITH LOW DOWN FEED. PATENTED FEBRUARY 26, 1895.

Tentering and Drying Machines on Pipe System. Special Dryers for Heavy Felt Goods. Hot Air Drying and Tentering Machines.



Fulling Mills, Washers, Chinchilla and Whitney Machines, Whipping Machines, Cone Willows, Marsden & Blamire Lap Feed, Dyeing Machines for Piece Goods, Soaping Machines, Wringing Machines, Jigs, (double or single,) Dewing Machines, etc.

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WATER WHEELS,
Horizontal and Vertical.
Iron Flumes and Penstocks.
Rotary Fire Pumps.
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Head Gate Apparatus.
Water Wheel Regulators.
Rotary Fulling Mills.
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and Washer for Knit Goods.
Endless Felt R'y Washers
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Chloride of Lime and
Peroxide of Sodium,
Dye Tubs and Rinsers.
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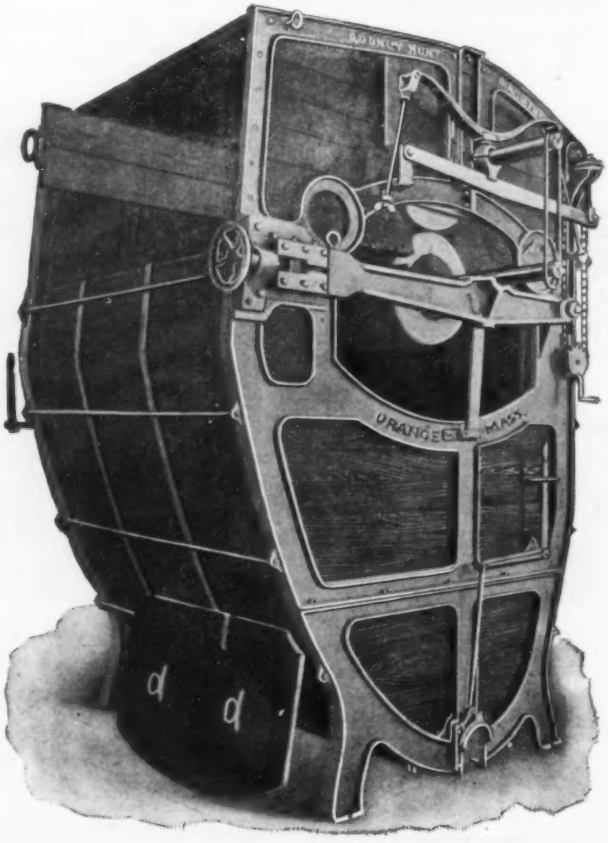
New Rotary Washer

FOR ENDLESS FELTS



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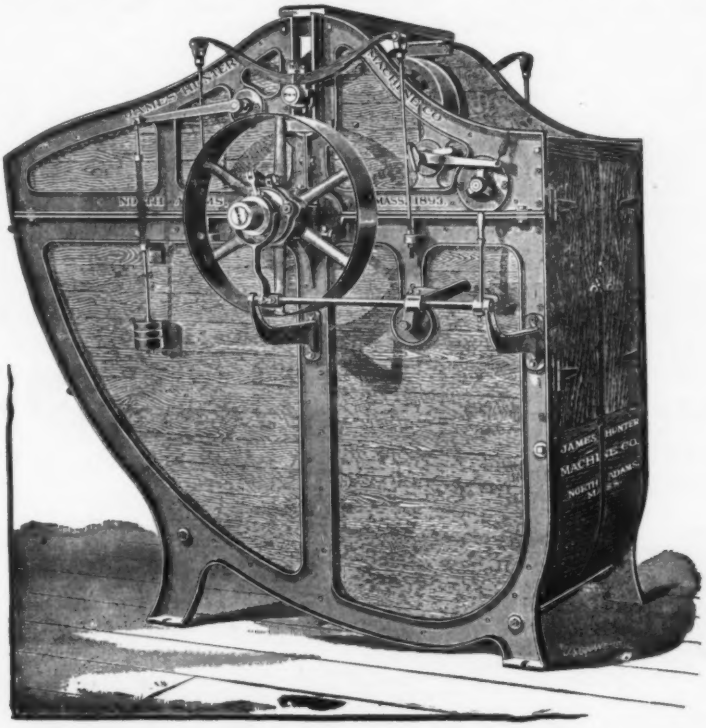
Main Office and Works,
ORANGE, MASS.

Automatic Wool Washers

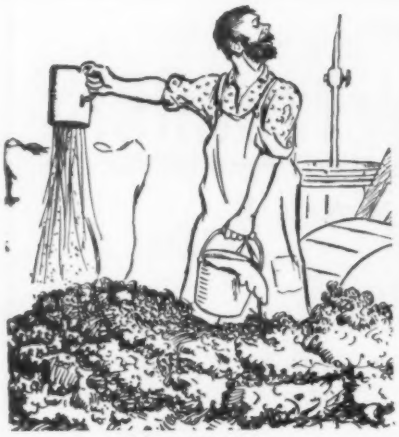
PARALLEL RAKE

The "STONE DRYER," for Wool, Cotton, Rags, Etc.
CARBONIZING MACHINERY, ETC.



Fulling Mills, Cloth Washers,
WOOL OPENERS, SELF FEEDS, DUSTERS

JAMES HUNTER MACHINE COMPANY, NORTH ADAMS, MASS.



What Changes!

THE OLD WAY.

Oiling stock with a tin can with holes punched in the bottom, or a watering pot. Wasteful of oil and labor and seldom done twice alike, but is still used in some mills.

THE MODERN WAY.

Oiling and dampening stock with the Spencer Automatic Oiler applied to feed table of wool picker, lumper or lapper. Batches treated as desired. Perfect regulation.

Not much need to dwell upon the advantages of the automatic system, by which uniform results are obtained with saving of oil and labor, as compared with the sloppy, guess work, waterpot system.

It's the story of the Bramwell and Apperly feeders over again. How many mills are feeding by hand to-day? There will be very few oiling by hand in a few years. Hundreds of the best mills are using the Spencer Oiler to-day. Are you? If not, send for particulars.

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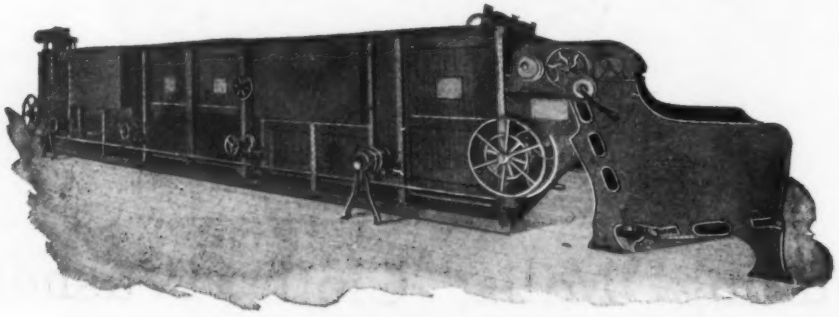
GRANITEVILLE, MASS.



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Stock Dryers, Wool Washers,
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"STEEL MIXTURE"
BOILER DOOR ARCHES AND FIRE BOX BLOCKS
TONGUED & GROOVED
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ARCHES MADE FOR ONE OR MORE DOOR OPENINGS
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for steam, water and gas.

BRASS, COPPER AND LEAD PIPE.

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Steam and Hot Water Heating Apparatus.

Steam Specialties, Pipe Fitters' Tools, Etc.

PIPE CUTTING A SPECIALTY.

Established 1870

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Builders of Improved

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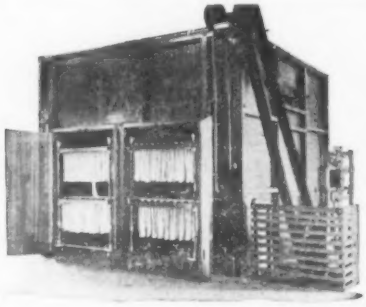
for WOOLENS, WORSTEDS, FELTS, etc.

Built Upright or Horizontal with Low Down Feed

Ventilating Fans a Specialty

Send for Catalogue



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ON THE

COLD AIR SYSTEM. Simple, effective, inexpensive. Leaves yarn in beautiful condition.

ALSO ON THE

HOT AIR SYSTEM when great capacity is wanted.

DYE STICKS, Kettle Sticks and dry and sulphur house Poles, also Sticks to suit the Wolstenholm Machine from natural water grown cedar, and Sticks to suit the Klauder-Weldon, Lorimer and Hussong machines from finer grades of lumber. These Sticks have been thoroughly tested, and pronounced the best on the market. Guarantee satisfaction to buyers. Write for prices.

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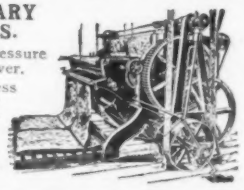
New and Second-Hand Cloth Presses

LATEST MILLER ROTARY STEAM CLOTH PRESS.

Patent Flexible Steel Bed. Pressure automatically appplied by power.

1 6/4 double bed second-hand press
1 8/4 " " " "
1 6/4 single " " "

at a bargain.



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WOONSOCKET, R. I.

E. FEARON & CO.

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Engines, Pumps, Boilers, and Electrical Machinery. | Textile Dyeing, Drying and Finishing Machinery.

Repairing and Jobbing Promptly Attended to.

Both 'Phones.

EUREKA FIRE HOSE

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THE BEST FIRE HOSE MADE

For use in

Cotton Mills, Woolen Mills and Factories.

(Trade Mark)

Seamless Woven and Rubber lined EUREKA COTTON HOSE, "TROJAN" brand, has no equal. Send for circular and Testimonials.

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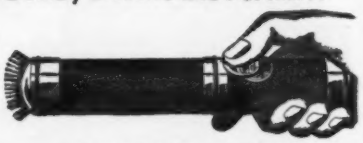
"Newman's" Latest Improved Portable Clock.

WATCHMAN'S CLOCKS, *Electric and Portable.*

Engine Room and Factory Clocks.

Time and Dating Stamps.

ELECTRIC TORCHES.



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Send for Catalogue and Prices.

DINSMORE

Mill Sewing Machines

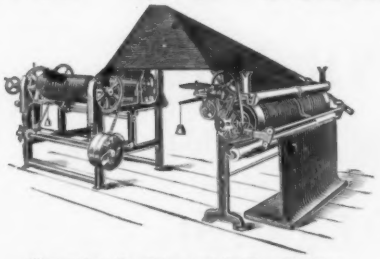
No. 9—Portable Foot-Power Rotary Sewing Machine.

It is especially adapted for use in Cotton and Woollen Mills, Bleacheries, Print Works at the Printing Machines, in Dye Works, Cloth Rooms, at the Fulling Mill, Snears, Calendars, Gigs, Drying Machines, etc., or any of the different finishing processes in textile mills.

Manufactured by the

DINSMORE MANUFACTURING CO.,
Salem, Mass., U. S. A.

WHY DONT YOU
MEASURE
YOUR CLOTH
WHILE YOU DOUBLE



Measuring, Doubling and Rolling Machine

IT PAYS

PARKS & WOOLSON MACHINE CO Springfield Vt

NORTH CHELMSFORD MACH. CO.

SUCCESSORS TO SILVER & GAY CO.

Manufacturers of

Automatic BALL WINDERS, adapted to all kinds of Twines, Silks and Floss. QUILLERS and REELS. Also SPECIAL MACHINERY from DRAWINGS or PATTERNS.

Repairing, Turning and Refluting Worsted.

Spinning and Drawing Rolls a Specialty.

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LOWELL CRAYONS FOR MILL USE.

Quality To Meet All Requirements.

Address for Samples and Prices,

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Original Makers.

Established 1844.

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(WM. J. BUCKLEY) **Gun Mill, Patterson, N. J.**

Manufacturer of all kinds of SPINDLES, FLYERS, RINGS, TUBES, CAPS, etc., for Cotton, Silk, Flax, Woolen and Worsted Machinery.

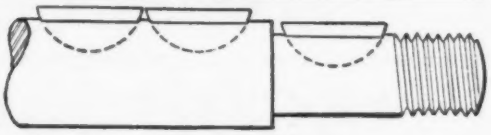
Roving Spindles and Flyers a Specialty. Light Forgings.

REPAIRING OF ALL KINDS.

Key Seating Attachment

FOR

Whiton Gear Cutter



We offer an attachment for use with our Gear Cutting Machine, to cut key seats for the Woodruff System of Keying. Write for description, circulars and price.

THE D. E. WHITON MACHINE CO.,
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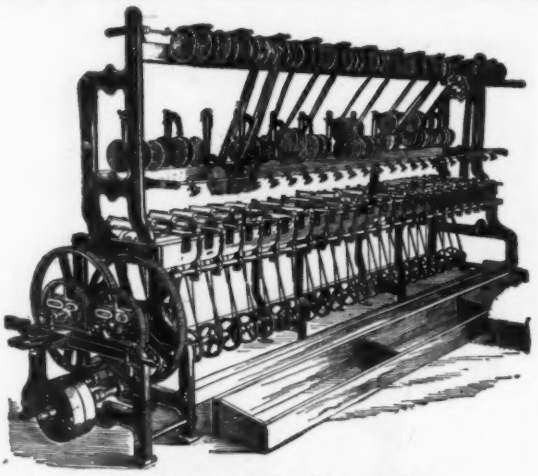
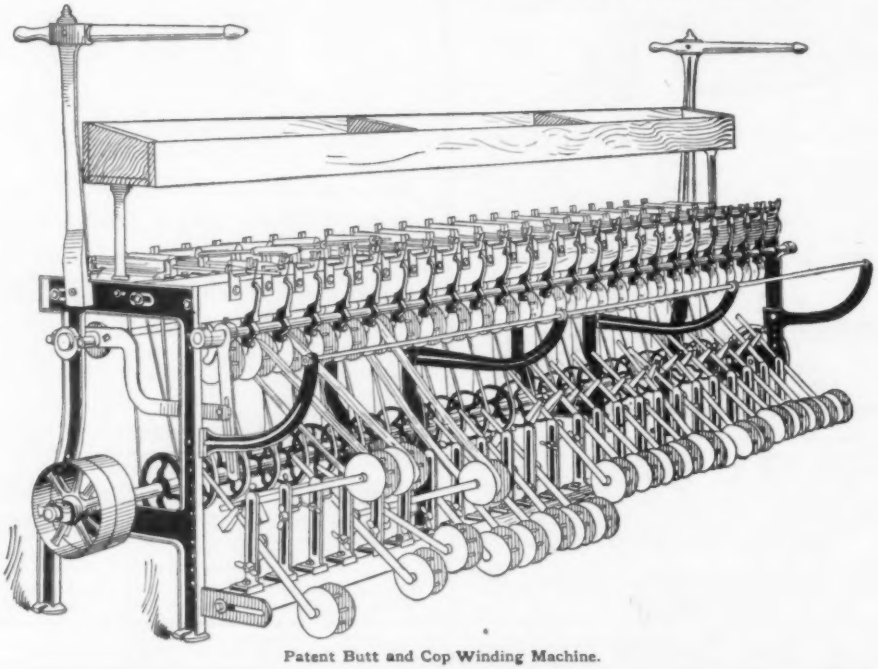
SPOOLING, WINDING, WARPING AND BEAMING MACHINERY



Patent Shuttle Bobbin Winder for Skeins, with Patent Variable Motion.

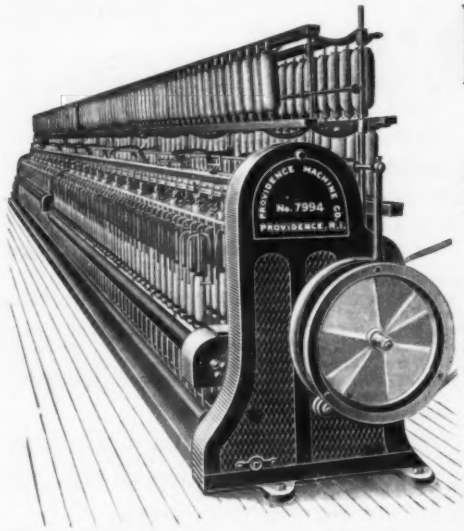


Patent Butt and Cop Winding Machine.

JACOB K. ALTEMUS,

2818 North 4th Street, PHILADELPHIA, PA.

FULL PARTICULARS ON APPLICATION.



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Manufacturers of

Improved Cotton Roving Frames

Improved Worsted Roving Frames

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Vulcan Fibre Roving Can.

BODY—Vulcanized Fibre. SIDE SEAM—Riveted with Patented Clinched Rivets. RINGS—Tinned Steel, Brazed Joints, Curled Edges. BOTTOM—IXXX. Tin Star Corrugation; Fastened without the use of nails or screws, will not crack, warp or shrink and cannot come out. FINISH—Coated inside and out with moisture proof coating, handsome and smooth. WEIGHT—About one-half pound per inch diameter. SIZE—All cans to any exact size, perfectly round and true. DURABILITY—Superior to any other can.

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HILL'S IXXX TIN AND GALVANIZED IRON DYE HOUSE CAN.

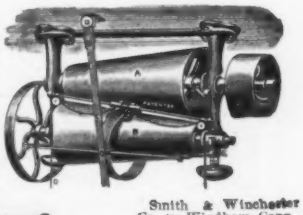
James Hill Manufacturing Co.,

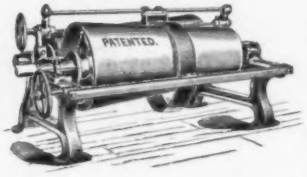
PROVIDENCE, R. I.

EVANS' FRICTION CONES.

Eight Thousand Sets in Operation in This Country and Europe.

A partial list of manufacturers who have Evans' Friction Cone Pulleys in operation, transmitting from ONE TO FORTY HORSEPOWER: National Biscuit Co., Richmond, Ind., 300 sets. Merrimack Mfg. Co., Lowell, Mass. 20 sets. Arnold Print Works, No. Adams, Mass., 11 sets. John & James Dobson, Philadelphia, Pa., 34 sets. Stinson Bros., Philadelphia, Pa., 40 sets. Frederic J. Falding, New York, N.Y., 20 sets.





Smith & Winchester Co., So. Windham, Conn., 250 sets. Furguson & McRae, Belfast, Ireland, 25 sets. Mercantile Laundry, So. Windham, Conn., 250 sets. Washburn & Moen, Worcester, Mass., large number, all sizes. Dennison Tag Co., Boston, Mass., large number, small sizes. Saco & Pettee Machine Co., Newton, Mass., 275 sets. Pacific Mills, Lawrence, Mass., 13 sets.

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ALL STYLES AND KINDS FOR FLAT AND ROUND BRAIDS.

SOLID SASH AND CURTAIN CORDS,

SHOE AND CORSET LACES, BANDING

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TEXTILE MACHINERY,

OF EVERY DESCRIPTION FOR COTTON, WOOLEN AND WORSTED.

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LOCKETT, CROSSLAND & CO., Engravers and Builders of Leather Embossing Machinery, etc., etc.
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DRONSFIELD BROS., Limited, Emery Wheel Grinders, Emery Fillet and Flat Grinding Machines.
COTTON CORD AND VELVET CUTTING MACHINE CO., Corduroy Cutting Machines, etc.

PICK GLASSES, LEATHER APRONS, PATENT WIRE CHAIN APRONS.

Pulley and Gear Forcer.

We build a simple, powerful and very effective machine to remove gears and pulleys from shafting. Many mills use them. **Only costs $8.00.** Saves its cost in time and breakage.

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The Prevention of Filling Waste

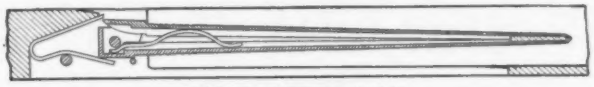
is assured by using the

NEVER SLIP COP SPINDLE

PREVENTS BROKEN COPS, SMASHES, WASTE, IMPERFECT GOODS AND ALL THE SHUTTLE TROUBLES WITH COP FILLING . . .

The illustrations explain this simple device:—
The spindle is split from the bottom to a point a short distance from the end. When in position to receive the cop, the spindle is of such a size that the cop can practically be dropped over it.
When the spindle is lowered into the shuttle the two parts forming the base are expanded holding the cop firmly in place. The pressure is sufficient to hold the cop on a smooth spindle but the corrugations at the base of the spindle hold the cop still more securely.
The spindle contracts when again raised and the empty cop is easily removed.

SHUTTLE SPINDLE OPEN.



SHUTTLE SPINDLE CLOSED.

NEVER SLIP COP SPINDLE CO., - - - 415 Broadway, New York.

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AMERICAN MOISTENING COMPANY

Equitable Bldg., Boston, Mass.

Received the HIGHEST AWARD on recomendation of the FRANKLIN INSTITUTE for

"Simplicity and Originality of Design."

Is the largest manufacturer of HUMIDIFIERS in the World. The last twenty years receiving the HIGHEST AWARDS in this country and Europe for its AIR-MOISTENING SYSTEM. EIGHT GOLD MEDALS and others.

The Only Perfect System of Air Moistening

And Has Been Adopted by the Representative Manufacturers of this Country.

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Renecked PROMPTLY with

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Our Pressers are Hand Forged from Norway Iron

Made any weight desired as per sample sent us.

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The best skilled English workmen employed on both our flyer and presser work. Write for prices and discounts. Steel Rolls renecked. *Don't throw away your old flyers. Send them to us and we will save you money.*

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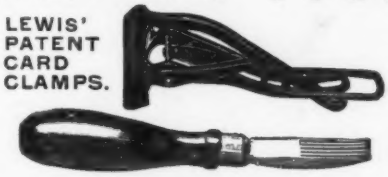

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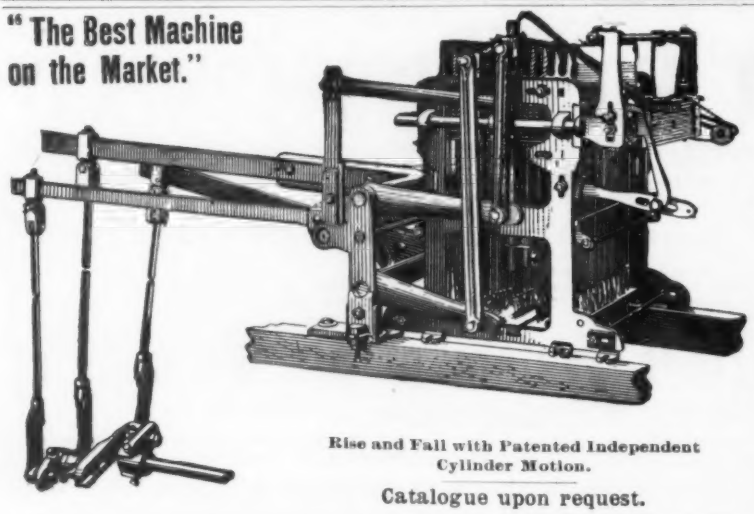

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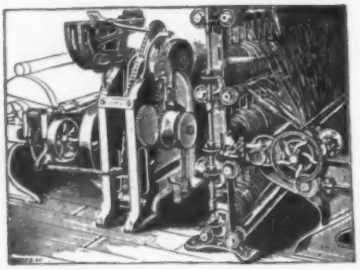

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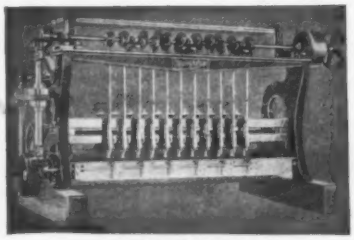

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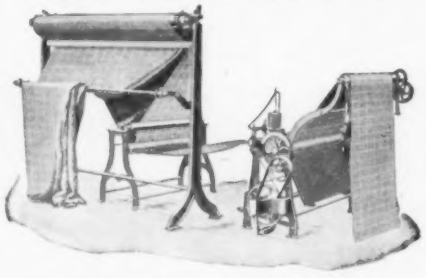

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For Preparing, Finishing Gills and Drawing Boxes

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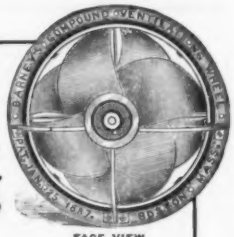
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Selling the Barney Fan is not the main object of our business. Fans are usually necessary in accomplishing our purpose and when air is to be moved, we find the Barney Fan is the most satisfactory air mover.

But we are consulting engineers in ventilating, heating, cooling and drying problems, and experts in air, steam and all vapor moving.

We first like to know what you want to accomplish, or what the trouble is. Selling a fan alone is often unsatisfactory—the study of each case, to know the conditions, location, proper size, speed, etc, are of vital importance.

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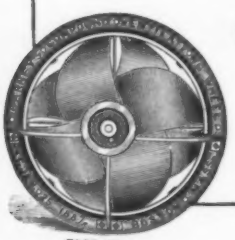
The question of steam in the dyehouse

just now is troubling many manufacturers and dyers.

If you are bothered in this way, drop us a line.

We guarantee results and it will cost you nothing to consult us. Why not write today?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Applied to Cloth, Wool, Cotton, Drying Rooms, Tables or Machines makes a guaranteed increase of 25 per cent.

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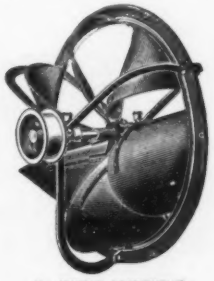
This is the Berry Wheel, the most efficient agent for moving air, eliminating steam and other impurities in the atmosphere.



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For Woolen Mills, Cotton Mills, Spinning Mills, Silk Mills, etc.

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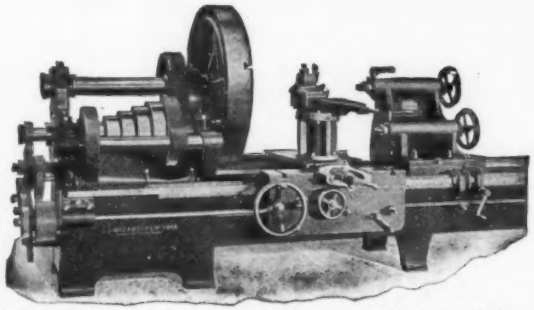

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NOT SO ODD.

Just an extra Lathe—that's all!

There's nothin' "special" about it—a simple arithmetical problem—if one Lathe is good—2 must be better—providin' the 2 aren't 2 expensive.

But mebbe you don't want 2 Lathes—need only one just now. Jeroosium! McCabe offers you a Lathe for nothing, and you ain't a-going to refuse it, be yer?

That's the way this "DOUBLE-SPINDLE" reckons up—a Modern, big, heavy 48-inch Lathe for half-price, and quick-working 26-inch besides.

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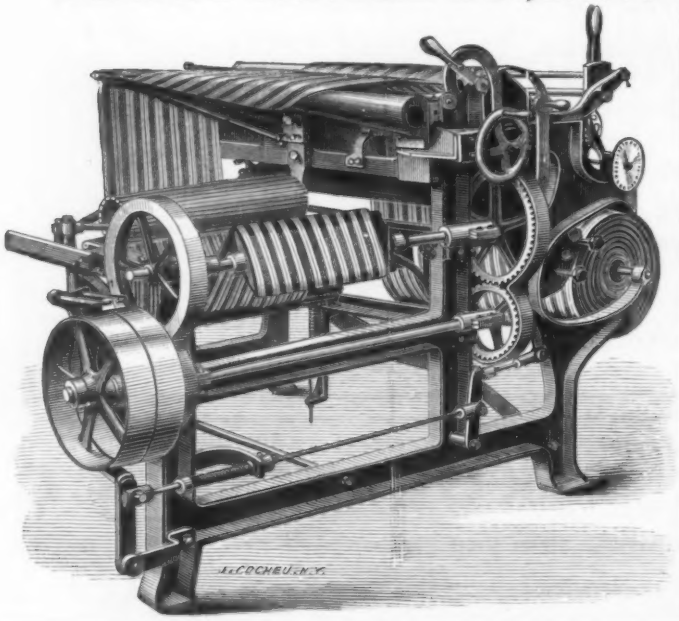

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and imprint the measurement upon fabrics, fold lengthwise and roll into merchantable packages all in one operation.

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A Fully Equipped Machine Shop for General Work.

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It is Light, STRONG, and lasts a lifetime.
It clamps to the shaft perfectly — keys and set-screws superfluous.
Interchangeable metal Bushings to fit shafts of different sizes.
Particularly adapted to TEXTILE manufacturing.

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Used on every kind of Fabric. Made in Silver, Gold and Colors.
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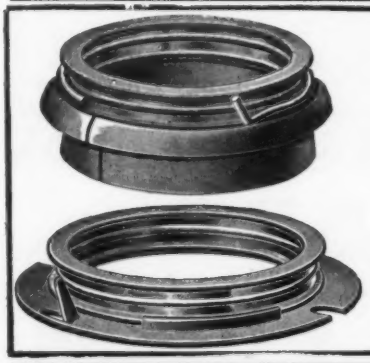

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THE CHAFFEE PATENT CLOTH BOARD,

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Will not split or warp;
Not liable to break.

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Clean
LIGHT
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VICTOR SHAW RING TRAVELER CO.

Incorporated 1899.

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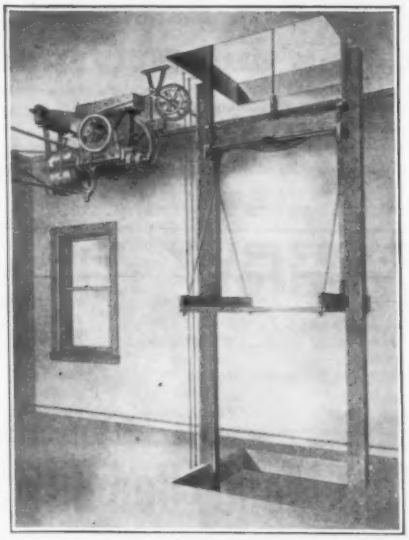

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At the price it's

The Marvel of the 20th Century

Works right all the time—that's what you get when you buy this elevator. 1000 pounds capacity, car not over 5 feet square, 15 feet lift. Price F. O. B. cars Philadelphia including all materials necessary to erect ready for belts (except lumber for posts and wheel timbers). We furnish drawings from which any competent mechanic can erect elevator.

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Write to-day for full details of this or any other Morse Elevator.

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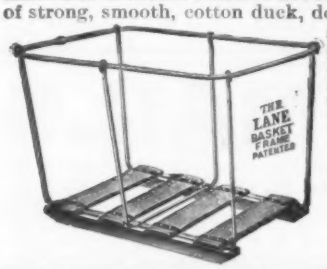

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FIG. 20.

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ELECTRIC POWER AND LIGHTING PLANTS

FOR ALL CLASSES OF

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73,000 Horse Power in use or under contract.

THE ADVANTAGES OF ELECTRIC DRIVE ARE:

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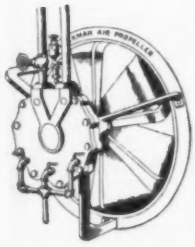
With Direct Connected Engines.



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Can be run at any speed and any time. No long shafting and belts to waste power.

For Dye Rooms, Factories, Boiler Rooms, or where there is moisture or dust they are the best apparatus ever installed.

E. M. NICHOLS,

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A. J. BECKLEY CO.

284 Pearl St., New York City.

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For Wool Scouring, Renser Boxes, Dyeing of Raw Cotton. Duster Screens, Picker Screens.

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Rattan, Ash or Canvas.

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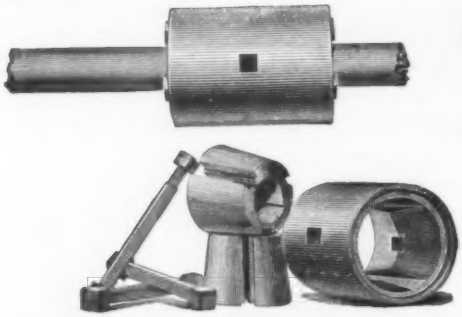

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DOUBLE CONE VISE COUPLING

has a way of holding shafts together, that no other COUPLING can equal.

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PULLEYS,
HANGERS,

and all most approved appliances for the Transmission of Power.

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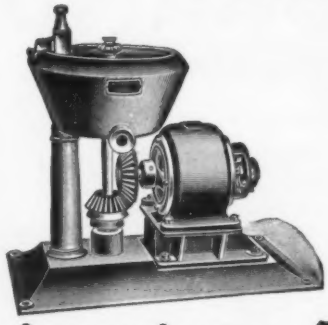

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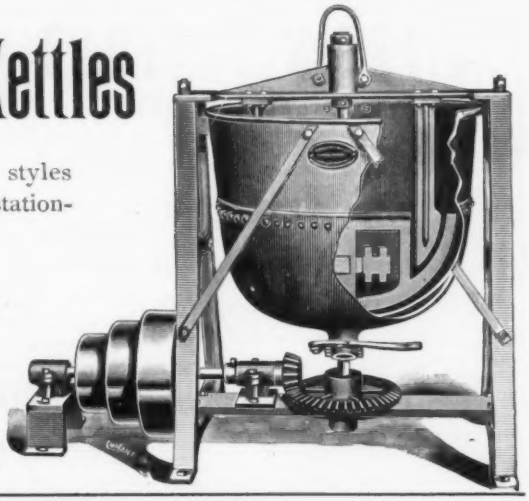

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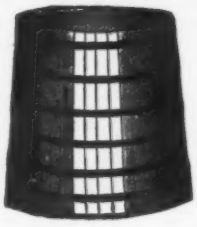

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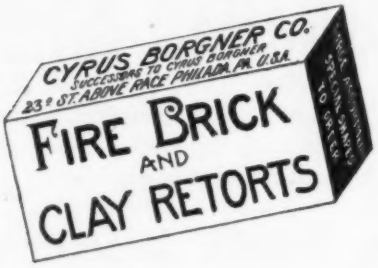

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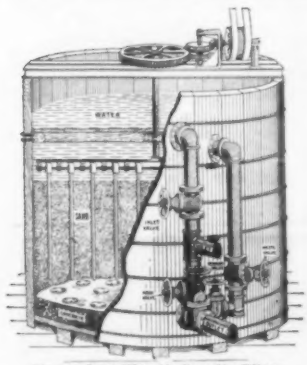

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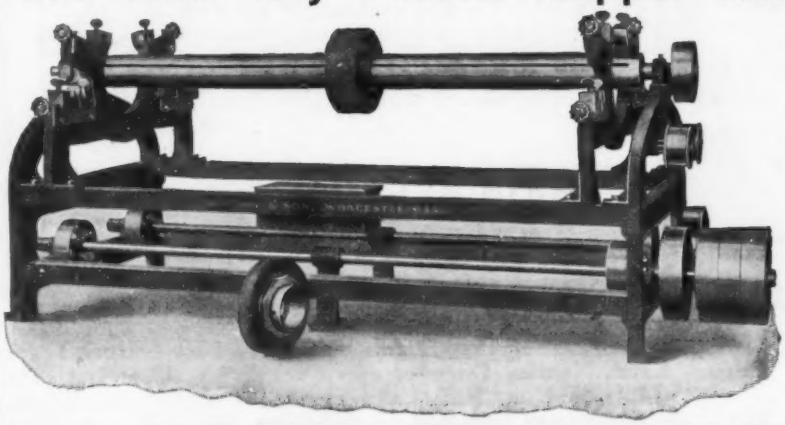

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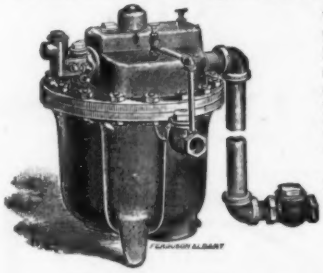

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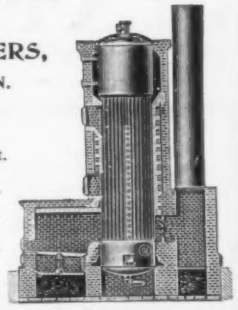

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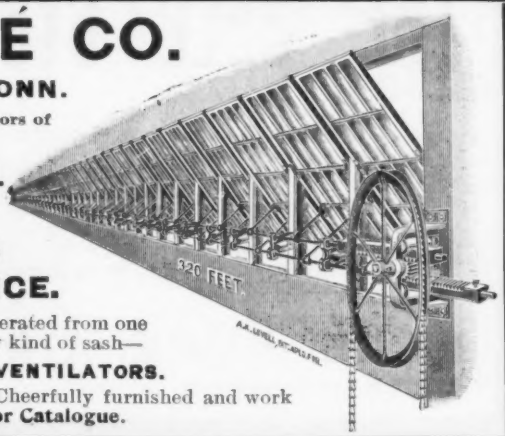

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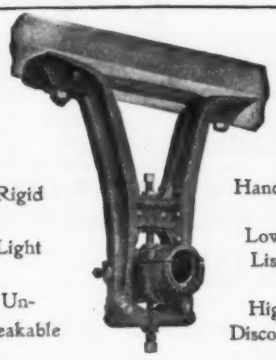

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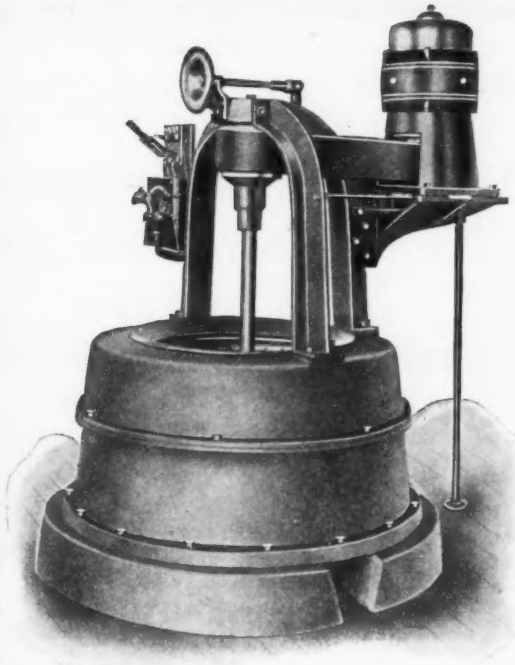

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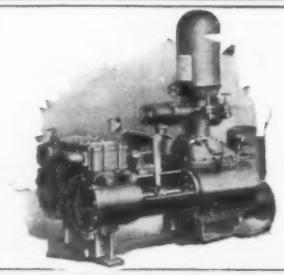

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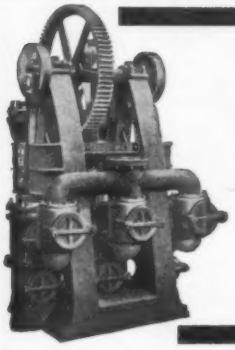

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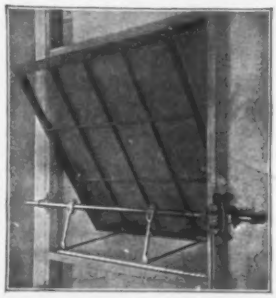

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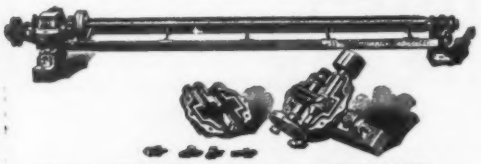

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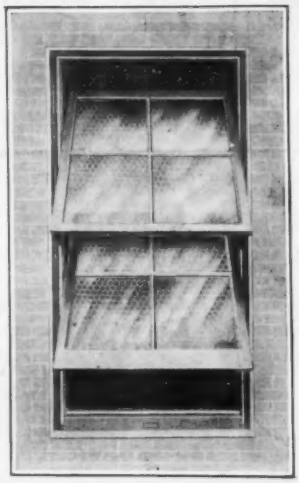

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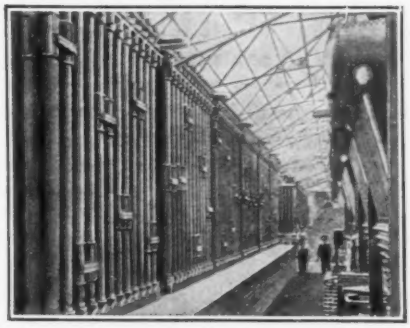

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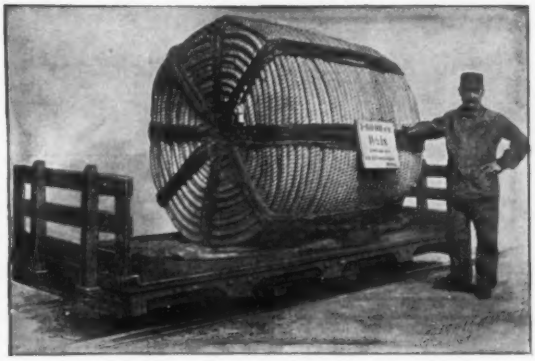

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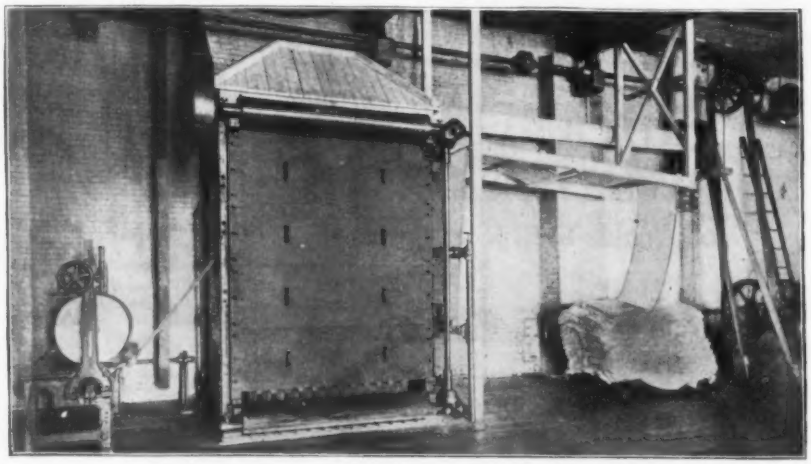

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PART I. Contains a complete directory of all the textile establishments in the United States and Canada. It tells what goods are made, the number of sets of cards, spindles, looms, whether and what they dye or finish, steam or water power, who the selling agents are, the names of the officers, superintendent and buyer.

There are 22 textile maps; gives population of town and railroad connections.

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PART III. Contains classified list of mills doing order and commission work, also dyeing, finishing, bleaching and printing establishments, classified according to the kind of work done, and so far as possible giving width of goods handled; also shoddy, extract and flock manufacturers and wool scouring establishments.

PART IV. Manufacturer's Selling Agents and Dry Goods Commission Merchants, giving the name and address of concern, character of goods handled, different departments, with managers, list of manufacturing clothiers, and suit and cloak manufacturers, giving specialties and buyers names. A list of city offices of textile mills is given.

PART V. Dealers and Brokers in raw materials and stock, including wool and shoddy dealers and brokers, cotton dealers and brokers, factors and buyers and wholesale rag dealers making a specialty of textile interests.

PART VI. Buyers Index of Textile Machinery and Supplies, and statistics showing textile machinery in the United States, giving spindles, looms, knitting machines, etc.

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Table of Contents for February.

PAGES.

Monthly Comment 63
Seasonable Fabrics 72
The Southern Cotton Association 75
Baling Egyptian Cotton 76
How to Increase the Cuban-American Trade 79
Mechanical Cotton Picking 81
Finishing Wool and Mixed Fabrics 87
Textile Advertising 88
TEXTILE PROCESSES.
Textile Design School—Curved Twills—Double Loom Temple—Tilting Reed Mechanism—Cotton—Foreign Novelties—Fulling, and the Machinery for the Process—Flocking and Flock Cutting Machinery 93
The Influence of Twist on the Cloth 113
Judging the Value of Raw Silk 116
English Notes 118
Low Grade Woolens 120
A Mexican Jute Mill 123
Cotton Growing in Australia 126
Cotton Mule Spindles 127
Testing Fulling Soaps 128
QUESTIONS AND ANSWERS 129
KNITTING DEPARTMENT.
Knit Goods Situation—Circular Latch Needle Machines—Striping Attachment for Knitting Machines—Underwear for the Western Trade—Patents—Mill News 131
NEW MACHINERY AND PROCESSES 143
DYEING DEPARTMENT.
The Testing of Mill Supplies—The Preparation and Dyeing of Jute—Discharge Effects on Cotton Velvets—Color Penetration on Heavy Felts—Color Cards—Recipes 156
MILL NEWS 161
PERSONALS 171
NEW PUBLICATIONS 174
BUSINESS LITERATURE 175
INDUSTRIAL NOTES 175
TEXTILE PATENTS 178
COTTON MARKET 205
WOOL MARKET 207
YARN MARKET 209
RAG AND SHODDY MARKET 219
DYE AND CHEMICAL MARKET 221

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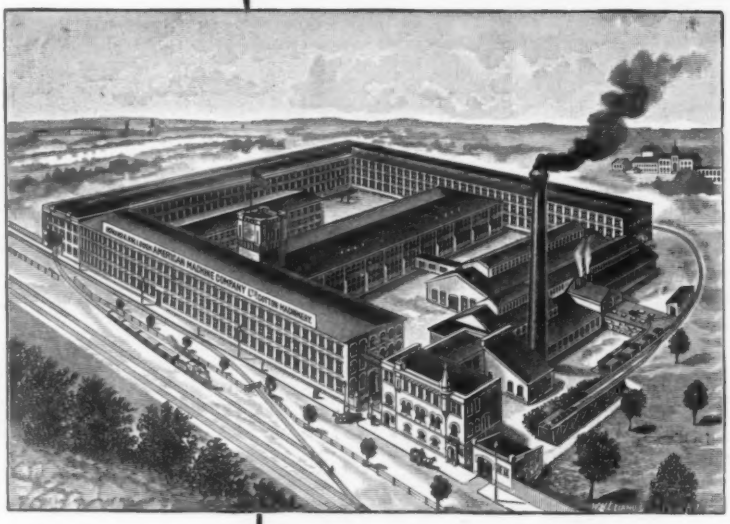

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VOL. 28. (NEW SERIES.) FEBRUARY, 1905 No. 5.

Monthly Comment.

The Wool Manufacturers' Meeting.

The fortieth annual meeting of the Annual Association of Wool Manufacturers was held at the Hotel Somerset in Boston on the afternoon of February 1st and was followed by a banquet, which was attended by about 200 representative wool manufacturers and their friends.

The speakers of the evening were the president of the Association, Mr. William Whitman, Hon. James S. McCleary of Minnesota, Hon. Washington Gardner of Michigan, both members of the Appropriation Committee of the House of Representatives, and S. N. D. North, for fourteen years secretary of the Association and now the director of the United States Census.

In his address, Mr. Whitman briefly reviewed the history of the Association during its forty years of active life and recalled the great good that it had accomplished for the industry, all of which was accomplished without legal counsel, agents or lobbyists, nor the expenditure of money for the purpose of securing legislation. Mr. Whitman stated that contrary to the general opinion, he is satisfied that the national legislation is not secured by the use of objectionable methods.

He called upon the Association to stand fast to the principle of co-operation with the wool grower, admonishing them that the fundamental principle of protection entitled the wool grower equally with the wool manufacturer to protection upon his product, asserting that this principle today is as zealously advocated by the Wool Manufacturers' Association as at the time of its foundation. This sentiment was the principal theme in the remarks of all the speakers.

Mr. Whitman alluded to the mistaken impression in the public mind that wool manufacturing had not made so great an advance in this country as other textile industries in consequence of the duty upon the raw material, but he showed by facts that wool manufacture has kept abreast and even ahead of other lines of textile industry, and that the wool manufacturers in the United States supply a larger proportion of the total wool manufactures consumed in this country than either the cotton or silk manufacturers supply of the total consumption of their product.

He touched upon the question of reciprocity, again affirming his radical position in opposition to reciprocity on principle as well as in practical operation. Mr. Whitman said, in closing:

"A very careful investigation leads me to believe that no attempt at tariff revision will be made in the near future. What demand there is outside of political circles is chiefly local and confined to commercial centres. . . .

"Should the committees of Congress, in their wisdom, feel impelled to take up the

work of tariff revision, I am confident the wool and woolen schedules will not be touched. We may feel reasonably sure that the present wool and woolen tariff will remain the law of the land for some years to come."

Congressman McCleary's address was a clear and forceful explanation of the protective policy of the United States as compared with Great Britain. He showed the fallacy of the popular impression that free trade in England meant that there were no duties and no revenue collected on imports, pointing out that while the United States collects only $3.60 per capita from its customs revenues on imports, Great Britain collects through her custom houses $4 per capita from products which in the main compete with her own manufacture, while the American policy is to tax only non-competing goods. Congressman McCleary, although born in Canada, is not an advocate of reciprocity on the lines which have been suggested in the East. He warned New England that the West was keenly alive to this question, was watching us very closely, and would not permit New England or any one section of the country to profit at the expense of the West. He believed in the reciprocity of James G. Blaine, and pointed out wherein that differed from the proposed measures of today. He emphasized the fact that the manufactures of the United States were one-third of the total manufactures of the world, and of that one-third, 97 per cent. were consumed within our own borders. "This great market," said he, "is the cream of the earth. You cannot enrich cream by mixing it with skimmed milk. Protect it."

Congressman Gardner brought a further message from the great agricultural sections of the country to the manufacturers, pointing out the difference in the point of view from which the great farming and agricultural districts in the West looked upon many of our political questions and urging manufacturers to realize the many divergent interests and do their share in harmonizing and reconciling them for the common good. He stated, in his opinion, there were some schedules of the tariff which seemed too high and they might be cut down, but the difficulty was to find a way to make the reductions. It is a mistake, said he, to believe that cheapness is synonymous with prosperity, and recalled the "cheap times" of 1893 and 1897.

The evening exercises were brought to a close by an interesting family talk by Mr. North, who referred to his long connection with the Association and paid an admirable tribute to his only predecessor in the office of secretary, the late John L. Hayes. He dwelt upon the usefulness that the Association had been in the past and predicted for it still greater service in the future, and called upon all woolen manufacturers to become associated with it.

Mr. North stated that one of the strongest impressions and most important lessons that he had gained in his long connection with the Association was the interdependence of all the different branches connected with the manufacture of wool from the grower to the distributer. However they might differ among themselves, their interests were so locked together that what injured one must ultimately be an injury to all.

At the business meeting preceding the banquet the following officers and committees were elected, most of them being the same as last year.

President, William Whitman, Boston, Mass.

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Treasurer, Benjamin Phipps, Boston, Mass.

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The annual report of Secretary McPherson gave gratifying evidence of the generally prosperous condition of the industry and the freedom from vexatious questions pressing for settlement. He reported that so-called "shoddy legislation" is still being demanded, and spoke of various resolutions adopted by different Western associations, but there seems to be no immediate danger of action on these lines. He gave an interesting resume of the world's wool supplies and predicted that the immediate future does not seem to promise a return to much lower prices.

The Preferential Tariff in Canada.

Statistics of the British exports of textile goods to Canada in 1904 show substantial increases over 1903, in spite of the fact that the preference to the mother country was reduced in June from 11 2/3 to 5 per cent. We pointed last July that this change in the preferential rate amounted in reality to very little, and would have no appreciable effect in restricting the imports of British woolens into Canada. The figures for 1904, recently compiled by the British Board of Trade, confirm this forecast. The 1904 textile imports show an aggregate increase compared with 1903 of nearly $2,000,000, divided as follows:

Woolens	$1,000,000
Worsteds	260,000
Cottons	320,000
Silk mixed	230,000
Linens	135,000
	$1,945,000

The change in the tariff last summer, by which the duty on British woolens was raised from 23 1/3 to 30 per cent., is equal to an increase of but 2 cents per yard on goods costing 30 cents in England. This is a mere bagatelle to the expert manipulators of shoddy and cotton in Yorkshire, and consequently the shoddy products of the cheap and highly skilled labor are coming into Canada in increasing volume, and rapidly strangling the domestic industry.

Carelessness at Washington.

In the regulation and care of our standards of weights and measures the Government at Washington is at present exhibiting a surprising degree of incapacity. Expressly empowered by the Constitution to fix these standards, Congress is discharging this important duty without making investigations of its own or availing itself of previous inquiries. Individual opinions of some leader in a committee room are the mainsprings of action that promise future trouble. The Congressional lack of purpose and knowledge in this respect are illustrated by the legislation for the government of the Philippines. For fifty-five years the metric system has been compulsory for official Spanish business, but has made practically no progress among the Philippine people. The first act passed by Congress in 1902 was based on a farrago of acres, hectares, feet, meters, miles and kilograms. As a result the government officials in the Philippines complained of the confusion and stated that the mixture of standards put them to much inconvenience.

Without making an inquiry to determine whether it would be in the interest of the people, a committee of the present House of Representatives framed a bill under which the fifty-five-year-old experiment of trying the metric system on the government dog is to be continued. That this bill was framed without deliberation is proved by the following amazing clause:

"Sections (of the former Act) are hereby amended by reducing all measurements therein, whether of distance, area or *value*, to the metric system."

Then follow the clauses in which measurements of value are reduced to the metric system by reducing dollars to pesos. The gold dollar of the United States is based on 25 8/10 troy grains of gold nine-tenths fine. In 1903 Congress fixed the Philippine peso at 12 9/10 grains of gold nine-tenths fine. In 1905 it provides that measurements of value shall be reduced to the metric system by reducing dollars to pesos, and a protest entered against such legislation is met with the arrogant reply that the bill cannot now be changed.

Equally culpable neglect to care for the standards of weight and measure is evident in the executive departments. The original prototypes by which all standards of measure throughout the country are verified and which should be guarded at Washington with the greatest care, have been on exhibition at Buffalo and St. Louis for the edification of a gaping crowd of sightseers, and in transit have been confided to the tender mercies of express companies. Of what value are they as standards after such treatment? Their value as standards can be restored only by taking them to London and Paris to be verified by comparison with the prototypes there. Moreover, the Government bureaus do their best to cast discredit on our ancient system and endeavor to usurp the powers of Congress in fixing the standards of weight and measure. Thus the National Bureau of Standards reported to the British Consul General at New York that "in 1893 the metric prototype standards, the metre and the kilogram, were adopted as the fundamental standards from which the standard yard and pound were to be derived," and the Bureau of the American Republics issues monthly a Bulletin containing the statement that "the metric system has been adopted by the United States of America." Moreover the verification of the yard by comparison with the meter, on which these stories are based, is but a pretense, because the yard is incommensurable with the decimal divisions of the meter.

Congress should wake up to one of the most important duties imposed upon it by Clause 5, Section VIII, Article I, of the Constitution of the United States. Before undertaking to discharge the great responsibilities there imposed, let the report of John Quincy Adams on the metric system, made to Congress in 1821, now buried in the Government archives or in second hand book stores, be printed, distributed and studied. In this way our law makers will be fitted to discharge their duty of fixing the standards of weights and measures. At present they are illustrating the following passage from that remarkable report.

> In this conflict between the dominion of usage and of law, the last and greatest dangers to the principle of uniformity proceed from the laws themselves. The legislator having no distinct idea of the uniformity of which the subject is susceptible, not considering how far it should be extended, or where it finds its boundary in the nature of things and of man, enacts laws inadequate to their purpose, inconsistent with one another; sometimes stubbornly resisting, at others weakly yielding to inveterate uses or abuses; and finishes by increasing the diversities it was his intention to abolish, and by loading his statute book only with the impotence of authority and the uniformity of confusion.

As the Germans See Us.

A large party of Germans, including engineers, mechanics, scientists, educators, merchants and manufacturers, recently returned home from an extended trip through the United States, made for the purpose of studying us, our natural resources, education and general capacity. Their conclusions have recently been published and as was to be expected they find much here with which to find fault. Our principal defect, in their estimation, is a lack of technical education. This is stated as follows:

> The meagreness of technical education, the trifling annual contingent of chemists, engineers, educated dyers, weavers and electricians, as compared with the throng of lawyers, physicians, dentists and unspecialized graduates turned out by our colleges and universities, seems to them short-sighted and improvident. The high standing and excellence of a half-dozen great technical schools in the United States are frankly conceded; but what are these in a country of 80,000,000 people, in which practically every student is destined for an active and useful life?
>
> But most surprising of all appeared to the German visitors the absence of any adequate system of special education for commerce, banking and foreign trade. They consider our so-called commercial colleges, where young men with a district or grammar school education are rushed through a three months' course of bookkeeping and commercial usages, little better than a farce.

While there may be some basis for this criticism from a German standpoint, it is misleading because it loses sight of one of the striking features of American life, the rapid development of technical instruction. We may not be as far advanced in this respect as is Germany, but it must be borne in mind that Germany is an old and thickly settled country with a population increasing but slowly, whereas the population in the United States is increasing at the rate of about a million and a half a year, half of which is composed of immigrants from Europe, largely unedu-

cated. We are engaged in a stern chase trying to overtake both the native and imported ignorance, and are making good progress.

Our wages do not suit these Germans. They are too high:

> They note also the enormous disparity between American and European wages, the high rates charged by express companies, and the general heavy cost of handling business in the United States, and conclude that, on the whole, the American danger has been greatly exaggerated, and that steadfast adherence by Germany to the educational system and commercial methods now in practice will leave the fatherland little to fear in future competition with American manufactured goods.

We trust this condition in our economic organization may never be changed. The welfare of the people depends on a maintenance of high wages, and an export trade that depends on low wages is not worth having.

In another part of their report the Germans refer to our ignorance of the outside world:

> There is, say these critics, in the United States, a pervading ignorance and indifference about everything outside the United States that, from the German standpoint, will be, unless corrected, a serious handicap in our quest of foreign trade. The careless confidence with which agents and salesmen are sent abroad, with no special preparation and with no knowledge of any language but their own, to do business in countries where only a trifling percentage of the population understands English, strikes these careful, methodical European experts as amazing.

While this may be true of America, it is doubtless true of every country, and it remains to be proven that our indifference to matters outside of this country is abnormally developed. Some of the sharpest criticism and deepest animosities directed against us have been based on our alleged propensity to interfere in the affairs of other countries.

One of our chief faults, in German eyes, is self complacency:

> There has been noticed, to begin with, on the part of our people a general feeling of complacent satisfaction with everything American, a secure conviction that whatever is done or produced by them is the best and that they have only to keep on as they have begun to have the future securely in their hands.

Why should we not feel satisfied? We have our peculiar troubles, to be sure, but on the whole we have more reasons for being content than has any other country on earth. This is proved by the large number of immigrants attracted to our shores. We have not space to enumerate all our advantages, but here are a few. We possess the best part of the earth, with inexhaustible natural resources that make the whole world tributary to us. A system of self government. A language that is spoken by more people than any other. The best system of common law, weights and measures on earth. We have the ocean on the east and west; and good neighbors north and south, with whom we create an American influence that dominates the Western Hemisphere.

Why should not an American be an optimist?

Arbitration.

For six months following July 25, 1904, the strike of the cotton operatives at Fall River caused heavy financial loss to the mill owners; and, in proportion to their ability to stand it, still heavier loss to the strikers. Here the similarity ends, for the operatives and those dependent on them were compelled to suffer physically, by the loss of income, to an extent that can never be known. The end of the struggle was brought about through the efforts of Gov. Douglas, who arranged a conference between the manufacturers and strikers, at which both sides agreed to refer the difficulty to the governor for settlement. The agreement under which work was resumed is as follows:

> "The strike to be declared off, and the operatives to return to work at once.
>
> "All operatives to be put to work in the mill in which they were employed when the strike began, as fast as practicable, and no discrimination to be shown on account of the present strike.
>
> "After resumption of work the governor will take up and investigate the matter of margins and submit his conclusions as to what average margin shall prevail on which the manufacturers shall pay a dividend of 5 per cent. on wages from the present time to April 1, 1905.
>
> "It is agreed by both parties that the margin fixed by the governor shall in no way prejudice future wage schedules.
>
> "On behalf of the manufacturers' committee,
> "NATH. B. BORDEN, Chairman.
> "On behalf of the Fall River Textile Council,
> "JAMES TANSEY, President."

The great pity is that such a common

sense agreement was not made before the strike began. Better late than not at all, and whether the governor's decision be in favor of an increase of wages or not, the principle of arbitration has been endorsed by both employer and employee in a way that cannot fail to promote its adoption in the settlement of future differences between capital and labor. The task which Gov. Douglas has undertaken is by no means easy, and may prove to be a thankless one. He deserves the hearty co-operation of all, employers and employees, as well as of the public, who desire to see justice done to all.

Foreign Trade in Textile Products.

More wool was imported in 1904 than in any year since the passage of the Dingley bill. The amount for 1904 was 186,572,683 lbs. A marked feature of this trade as compared with 1903 was the decrease in the quantity of carpet wool, of which 107,052,996 lbs. was brought in last year, as compared with 123,096,269 lbs. in 1903. This decrease was more than made up by an increase in the imports of Class 1 (clothing) wool from 37,726,690 lbs. in 1903 to 56,685,984 lbs. in 1904; and of Class 2 (combing) wool from 12,770,932 lbs. in 1903 to 22,833,703 lbs. in 1904.

The imports of woolen goods for 1904 showed a decrease as compared with the two previous years, the figures being: 1904, $16,131,785; 1903, $19,321,505; 1902, $18,771,774.

A marked decrease in the cotton imported is noted in 1904 as compared with 1903 and 1902. This was doubtless due to the scarcity and high prices prevailing in the Egyptian market, which supplies four-fifths of our imported cotton. In 1904 the total imports amounted to 49,067,420 lbs., as compared with 63,196,016 lbs. in 1903, and 85,366,952 lbs. in 1902. This decrease for three years has been coincident with an increase in price. Thus the average price of imported cotton in 1902 was 12.6 cents as compared with 15.4 cents in 1903, and 17.5 cents in 1904.

Our purchases of foreign cotton goods in 1904 amounted to $47,423,181, as compared with $52,713,664 in 1903, and $48,954,355 in 1902.

The prosperity of the United States is reflected in the imports of raw and manufactured silk in 1904. We purchased last year 16,578,005 lbs. raw silk valued at $54,878,276, as compared with 11,655,333 lbs. valued at $43,135,197 n 1903, and 13,762,254 lbs. costing $46,736,204 in 1902. This gratifying increase in the supply of raw material to supply the expanding silk industry during the past three years was accompanied by a gradual and gratifying increase in the imports of manufactured silks, which were valued at $35,567,750 in 1902, $33,995,179 in 1903, and $31,030,522 in 1902. The only two countries whose exports of silk goods to the United States in 1904 show an increase over 1903 are Austria-Hungary and Japan. The trade of the former is insignificant, amounting to only $133,738. The exports of Japanese silks to this country are not only large in the aggregate, $5,399,692 in 1904, but show an increase of 56 per cent. as compared with 1903.

Our textile exports consist almost wholly of cotton and cotton goods. For the past three years this trade is summarized as follows:

	Cotton.			Cotton Goods.
	Bales	Price per lb.	Total.	
1902	6,687,441	8.5	$290,491,225	$33,274,907
1903	7,091,926	10.5	378,635,778	27,131,950
1904	6,561,643	10.9	368,839,188	33,660,617

Fine Woolen Goods.

The trade in fine woolen goods made in the west of England is in a bad way, and several of the most prominent mills have been closed and the business discontinued during the past year. All have suffered severely from the prevailing depression. Buyers have ordered only as they required goods, for their immediate requirements. The mill cost of the goods has been increased not only by a decrease in production, but also by the high cost of wool. The Continental and Colonial demand is reported as normal, but the difficulties of the mills arose from the poor domestic trade and the lack of demand from the United States. This state of things in the English fine woolen trade proves beyond a doubt that the foreign market has nothing to offer to American woolen manufacturers. If the English mills with the advantages of cheap wool, cheap labor, thorough organiza-

tion and possession of the markets are unable to survive, the prospects for our mills with more expensive wool and higher wages in new markets would certainly be hopeless.

apanese Progress.

Fifty years ago an American Commodore knocked at the closed door of Japan and awakened her people from a medieval slumber. During the short time since that summons, but a day in the development of a people, Japan has overtaken the head of the procession in the arts of both war and peace. One of the most striking features of this progress has been her selection of the best methods of other countries. This policy is illustrated in the rapid adoption of English standards of weight and measure by the Japanese people, a fact to which attention is called by the following letter from the British Weights and Measures Association, 25 Victoria St., London, S. W.:

London, S. W., Jan. 10th, 1905.

Editor Textile World Record:

Referring to your January issue, page 118, there is an account of an interview which your English representative had with me. He makes a slight error in his figures referring to Japan. Instead of saying that of 700 dozen of rules ordered for Japan "one-third were Metric, and two-thirds English," it should have been "three dozen only were Metric and 697 dozen English!"

Trusting you will give this due prominence in your next issue, I am, yours faithfully,

Geo. Moores, Sec.

Trade With Cuba.

Cuban affairs are the subject of a very valuable report by F. Steinhart, American Consul-General at Havana. He refers incidentally to the contract made by the Republic, a corporation, to raise the wreck of the Maine. The contract provided that work should begin in December, 1904, and be completed within one year. The consular report thus refers to the reciprocity treaty with Cuba, which has been in force since Dec. 27, 1903:

The life of the reciprocity treaty is still too short to speak intelligently as to the benefits derived by the United States, but there is reason to believe that with a little more assistance through differential duties on a few articles (such as rice, paper, shoes, hardware, glassware, and earthenware) the increase of trade between the United States and Cuba will show beyond a doubt the wisdom of the policy, provided the application thereof is made by means of sufficiently wide concessions.

Since Mr. Steinhart's report was written, the statistics of the Cuban-American trade for the first eleven months under the reciprocity treaty have been published. The exports of cotton goods from the United States to Cuba for these eleven months under the treaty and for the corresponding periods of 1902 and 1903 before the reciprocal trade arrangement was made:

COTTON GOODS EXPORTED TO CUBA.

	1902.	1903.	1904.
Cloth	$197,262	$260,044	$612,663
All other	144,488	214,868	334,685
	$341,750	$474,912	$947,348

The exports of cotton goods for the first eleven months under reciprocity were thus almost exactly double the amount for the corresponding period of the preceding year. Unquestionably a part of this increase is due to the improved condition of Cuba.

Consul-General Steinhart includes in his report some practical advice to American exporters on the proper methods of increasing their trade with Cuba; these appear on another page of this issue.

Better than Burning Cotton.

Sulphur Springs, Texas, is showing the South what to do with the surplus stock of cotton. While a few planters have been setting the torch to seven cent cotton with the object of increasing the value of their property by destroying it, Sulphur Springs is converting cotton into cotton mill stock. Instead of burning the staple or giving it away for seven cents a pound, the farmers of Sulphur Springs propose to convert it into mill stock on a basis of ten cents a pound, build a cotton mill and manufacture cotton, including the capital stock, into yarn and cloth. Although the following program as outlined by the Sulphur Springs Gazette, contains no

reference to such details as the supply of skilled labor, class of goods to be made, cost, selling prices and prospective margin of profit, it is nevertheless of much interest on account of the unique methods by which the Texas farmers propose to solve the cotton problem:

Prospects are good for a cotton factory for Sulphur Springs. If our people will all pull together the enterprise is assured. And it looks like they will all pull together. Tuesday morning there was a meeting of the citizens of Sulphur Springs at the court house for the purpose of formulating plans for the building of a cotton factory here.

The plan is to organize a company of Hopkins County people, $300,000 authorized capital, $150,000 of which is to be paid up. This stock is to be divided into shares of $50 each, and may be paid in either cash, or cotton at ten cents a pound, basis middling.

Meetings were held Wednesday and Thursday mornings and considerable interest in the project is being evidenced by men who do not do wind-jamming stunts nor talk for the sake of attracting attention. They are men who represent the substantial business interests of Sulphur Springs, have made a success of everything they have undertaken, and if they are unsuccessful in this undertaking it will be their first failure. We don't think they will fail.

The farmer is very greatly benefited by taking stock. He can put in his surplus cotton at ten cents a pound and receive full paid non assessable stock in the factory.

It is proposed to pool three thousand bales of cotton and with this as a resource to build the factory. The cotton will be taken off the market absolutely, thereby reducing the apparent surplus. A farmer who has a bale of cotton that is worth $35 in the market can put it into this organization and receive $50 in stock.

There will be a meeting at the court house this morning at nine o'clock and every person in town is urged to attend. It was agreed by those present at the meeting yesterday to close their stores and take all their clerks to the meeting. Won't you do likewise?

This undertaking should pay dividends from the start. With our vast lignite deposits, the fuel problem is a minor matter and with our large water reservoir there is nothing to handicap the problem.

We believe the undertaking will be carried to a successful issue. Why do we believe this? Because of the men promoting the enterprise. Are John Hargrove, Oscar Pate, Phil H. Foscue, B. F. Crosby, W. F. Skillman, T. C. McCorkle, J. H. McClimons, B. F. Ashcroft, Babe Henderson and W. F. Henderson wind-jammers? We don't believe they are. We know they have never been. Now that they have put their shoulders to the wheel we feel encouraged to make the positive prediction that the whistle of the cotton factory will be a reality in Sulphur Springs before the close of 1905.

No, sir. These gentlemen are not wind-jammers.

With the stores closed and the clerks all at the court house meeting it must have been a great day for Sulphur Springs. Nothing to handicap the enterprise as long as the Sulphur Springs reservoir remains intact to water the stock from seven to ten cents.

Exports of Cotton.

As a result of the recent decline in the price of cotton the United States received only $48,777,658 for the 610,246,524 lbs. of cotton exported in the last month of 1904, an average of 8 cents per pound. In December of the preceding year, 1903, the exports amounted to 610,246,524 lbs., or over 27,000,000 lbs. less, for which we received $72,375,921, or $23,598,263 more, the average price being 12.4 cents per pound.

In other words, in December, 1904, we received $23,598,263 less than in December, 1903, for 27,000,000 lbs. less. This is a loss of money to the United States, but it is a corresponding gain to the rest of the world.

The export movement of the new crop is generally reckoned as beginning on September 1. For the following four months of 1904, the cotton exports amounted to 2,250,158,162 lbs., valued at $215,183,345, or 9.6 cents per lb.; as compared with 2,000,180,254 lbs., valued at $221,804,007, or 11.1 cents per lb., in the corresponding four months of 1903. Thus during this period of four months from Sept. 1 to Dec. 31, we sold 250,000,000 lbs. more of cotton in 1904 than in 1903, and received $6,620,662 less for it. The exports for these four months of 1904 amounted to 4,350,084 bales, or only 445,286 bales more than in 1903. This increase does not bear out the high estimates of the current crop, which, however, may materialize later in the export trade. It is interesting to compare the amounts taken during the past four months of 1904 by the different countries:

	Bales.	Value.
Great Britain	2,069,496	$103,447,797
Germany	1,094,449	53,650,129
France	469,319	22,792,166
Italy	227,286	10,833,564
Spain	142,214	6,942,343
Russia	73,295	3,432,303

Belgium	62,648	3,140,984
Other Europe	58,532	2,797,833
Japan	69,597	3,859,409
Canada	47,246	2,402,251
Mexico	35,717	1,867,898
All Other	285	16,668
	4,350,084	$215,183,345

Counting both week days and Sundays the exports of cotton during these four months amounted to more than $17,000,000 per day, of which all but 3 1/2 per cent. went to Europe. These figures show the immense tribute that Europe pays to the United States for cotton. If this supply should be stopped it would spread panic and distress in every city and hamlet of the Old World, and it is this fact that guarantees peace between the United States and the rest of the world.

French Knitting Mills.

Troyes is the center of the leading knitting district of France. The products include both plain and fancy goods, nearly all made of cotton, and are exported to all parts of the world. There are 70 knitting mills in the city of Troyes giving employment to 15,000 operatives, and equipped for both seamless and full fashioned hosiery and underwear. The hosiery varies widely in quality, selling for $1.00 to $6.25 per dozen.

Recently a committee from the French Chamber of Deputies made an official inspection of the Troyes mills, and their report contains some interesting information regarding industrial conditions in that great knitting center. The hygienic conditions were found to be excellent, the work rooms being well lighted and ventilated. The working time is 10 hours per day for men; in some of the mills the time has been reduced to 8 1/2 hours for women. The knitters, who work by the piece, earn from $1.00 to $1.50 per day. Children, from 30 to 75 cents per day. These rates are high for France, being considerably above those prevailing in the linen mills of the North.

The committee reports that harmonious relations prevail between employer and employee, there having been no strike at Troyes in the past five years. One of the manufacturers, M. Vitou, comes in for special mention because of his efforts to improve the condition of his workers. He has reduced the hours of labor for the female operatives without causing any decrease in production, thanks to improvements in his mill organization. Each knitting frame in his mill is separated from the others by partitions, which prevent conversation between the workers without preventing communication between them when necessary. It is claimed that as a result the workers do as much work in 8 1/2 hours as they formerly did in 10 hours. M. Vitou lets the housewives among his help go home a half hour before the men in order to prepare the noon meal. He has established a well appointed nursery in connection with his mill, where the women can leave their babies to be cared for during working hours. The women are allowed to leave their work every two hours to nurse their babies.

While M. Vitou is doubtless to be commended for these arrangements, the fact that women with nursing babies find it necessary to work in the mills indicates that the lot of the French workers is far from an ideal one.

Cotton Goods in Liberia.

From Liberia comes a report by Geo. W. Ellis, Jr., Charge d' Affaires, in which he calls attention to the small amount of cotton goods sent to Liberia from the United States. Of this trade, which amounts to about $100,000 yer year, 46 per cent. comes from England; 12 per cent., from the United States; and 42 per cent. from other countries. The report adds:

> England leads easily in the sales of cotton goods to Americo-Liberians, while Germany leads in the trade with the native Africans. On account of the losses, delays, and damages attending the shipping of American goods via Liverpool or Hamburg, Liberian merchants, while preferring the cotton goods of the United States, choose those of England which are nearer the American styles than those of Germany.
>
> The manufacturers in Germany have produced a piece of cloth which is very much liked by the native Africans. It is known here as blue print—"blaudruck," as the Germans call it. It is made in 12-yard pieces, 28 to 30 inches wide, and sells in Liberia at $1.92 cash and $2.40 in trade. This blue print has been so successful with the natives that English manufacturers have made several attempts to produce a similar article. Thus far they have failed, the native African at once detecting the difference. The German blue print is therefore without a successful rival with the natives. There is much to be made in this trade, profits ranging, it is said, from 50 to 200 per cent.

Seasonable Fabrics.

MEN'S WEAR WOOLENS.

During the month a number of new lines have been opened and with the advent of the majority of buyers of the country the district presents an animated and buoyant appearance. The orders booked seem to equal, if not eclipse, those of previous years; notwithstanding the radical advances in price quotations. The buyer has been educated to expect a higher level of prices, but few expected to pay $1.20 for lines bought at $1 a year ago. In some instances they have withheld their orders, claiming that lower figures will be obtained later on, but these who have taken this course are in the minority. These buyers assert that, admitting the raw material situation warrants a higher level, the prices now asked for clays and serges are above the requirements and that the manufacturers are taking advantage of the existing conditions to enhance corporate wealth or declare larger dividends.

For several years a decline in the demand for clays has been noticeable, but this season this has become more marked and buyers are turning their attention to thibet and similar materials on which no such radical advance has taken place. The request for serges is said to be very satisfactory, and some numbers have already sold so far ahead that the lines will soon be withdrawn.

The fabric that is receiving the greatest degree of attention is the mercerized worsted, and it seems as if its popularity will continue for another season. The fancy woolens that are shown are also well thought of and do not show more than 7 1/2 to 10 per cent. advance.

Fancy overcoatings are doing well, but the designs and coloring have been considerably modified from those of last year. Those at present most in favor are fancy weaves in black and oxford. Kerseys in the better grades are being well supported and the general tendency seems to be for the better qualities in almost all lines. Brown kerseys, which were so popular a year ago, appear to have run their course and this season the demand is principally for black, grey and oxford mixtures.

In Division 1, Department B, the American Woolen Co. is showing piece dye fabrics in a wide range of styles and prices, also plain and fancy mixtures. Plain twilled mixtures are quoted 16 oz. at $1.20 and $1.25, 18 oz. at $1.62 1/2, an advance of 20 cents per yard over last year.

New fabrics in fancy weaves in 16 and 18 oz. weights vary from $1.45 to $2.00. Plain and fancy cheviot mixtures are shown at $1.17 1/2 to $1.32 1/2. Fancy weave piece dyed cheviots, both in finished and unfinished effects, from $1.10 to $2.25. These quotations are from 10 to 15 per cent. above last year. The most radical advances noted are on the heavy weight clays. Last year 18 oz. regular grade were quoted at $1.35, the price this year $1.57 1/2; 20 oz. last year $1.47 1/2, this year $1.70. Serges show an average advance of 15 per cent. over last year and unfinished worsteds show an average advance of 20 per cent.

Geo. O. Leavitt, selling agent for the Geo. H. Gilbert Manufacturing Company, announces the following prices on serges: $1.00, $1.12, $1.25, $1.40, $1.60, $1.80, $2.00 and $2.10, an advance of 10 to 15 per cent. over last year. The lines of T. H. Wilson are shown by Thos. Ould as follows: 13 oz. coverts, $1.30. Fancy back coverts, $1.87 1/2; 12 oz. rain cloths at $1.25, 14 oz. at $1.37 1/2.

Parker, Wilder & Co. are showing a wide range of thibets in prices varying from 50 cents to $2.50, with an advance only of from 5 to 7 1/2 cents per yard.

The Coronet Worsted Mills announce 10 to 15 per cent. advance on their new lines ranging from $1.35 to $2.35.

DRESS GOODS.

The domestic manufacturers, as well as the importers, report a satisfactory business on lines for spring and summer wear; the fall lines have not yet developed to sufficient extent to predict the outcome. An advance of from 5 to 10 per cent. is the rule with some

few lines at last year's level. Light weight broadcloths are still in the ascendant, with mohair a good second; the feature of the spring business is the revival of Henriettas, which during the last five years have been relegated to the background; this fabric promises to regain all its old-time popularity, and both importers and domestic manufacturers are straining every effort to meet the demand. One of the standard domestic brands is the "Royal," made by the Botany Worsted Mills, 44 inches wide at 60 cents. It is interesting to note that this "Royal" Henrietta was sold in 1896 at 39 cents, in 1900 at 65 cents, which reflects the condition of the wool market at the time.

There is also a revival of the old-fashioned French serges, as well as prunellas, drap d'ete, melrose, armures and wool poplins; but mohair is still the fabric par excellence both in plain and fancy patterns at this time of the year; no material is more thoroughly serviceable, sheds the dust better or is lighter in weight.

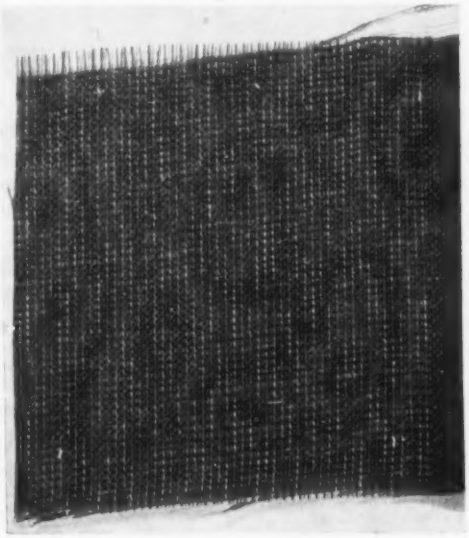

FIG. 1.

Ombre effects, similar to Fig. 1, sold by King & Beals at 87 1/2 cents, are to be general favorites. Green and brown, shaded from one to the other and checked with a surface color is a happy combination. A jacquard effect of domestic manufacture sold by J. C. Milne, through A. Wimpfheimer & Bro., is one of the leaders with exclusive trade.

Sheer goods, such as embroidered voiles, will most probably meet with a marked success, also that gleaming, lustrous material called eolienne and crepe de Paris command interest and no dress goods department is complete unless a variety of fresh fabrics is included.

SILKS.

The healthy condition of the silk market continues uninterruptedly, and the business

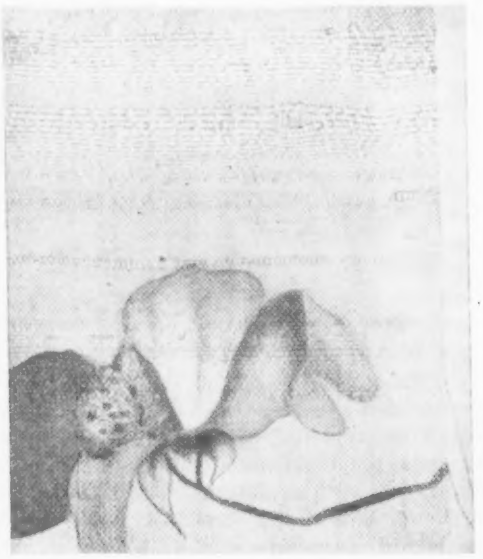

FIG. 2.

done is eminently satisfactory to manufacturers. Leading concerns have booked larger orders than for any corresponding season during recent years. The orders placed show that taffeta occupies first place. Fancy silks have also forged to the front and are now looked upon as better property than at first thought possible, but no especial change has occurred in the relative position of the fabrics from the standpoint of popularity, except that the tendency is away from the plain soft finished goods, such as messalines and peau de cygnes, and that there is less demand for black goods in all weaves than was the case a few months ago.

Among the novelties most popular with the exclusive trade are the rough Shantungs, rich in weave, lustre and finish, closely resembling the products of Oriental hand looms. These are brought out under various trade names, two of the most prominent being the "Rajah" and the "Burlingham," at 85 cents and $1.25 respectively. They are the productions of the Clifton Mills and are sold by Rogers & Thompson. The printed "Rajah," illustrated at Fig. 2, is produced by the same mill.

Notwithstanding the predicted decline in the popularity of checks and plaids, they are more than ever fashionable, and the bulk of fancy silks is of the neat, small designs suitable for the shirt waist suits.

One new feature which has made its appearance is the embroidered taffetas such as small embroidered flowers and geometrical designs on plain taffeta ground. Fig. 3 shows one of these designs, sold by Valentine & Bentley, in 19 inches wide at 90 cents. It is stated that embroidered designs in all materials will be the novelty of the spring and summer season. Warp prints in old fashioned designs are also coming to the front, and give promise of being well in the van before the end of this season. It is also predicted that brocades will soon regain their old-time vogue, but up to the present the request is limited.

Foulards always possess a certain prestige, being cool and attractive, and fill a place as no other silk fabrics can. Pompadour prints are most attractive and should not be overlooked. The designs are very delicate, garlands of flowers, loose blossoms and clusters, showered all over the myriads of small dots woven in the material.

WASH GOODS.

The collection brought out by the importers form a wide variety of beautiful materials, ranging in price from 12 1/2 to 85 cents. Printed organdies deserve special mention. This material in different colored grounds with large floral effects is most attractive. tulle, point d'esprit and plumetis are of this class, possessing exquisite floral designs in soft colorings, in light blue and tan grounds with Dresden effects and are especially desirable for misses' and children's dresses. Organdie carreaux is perhaps the newest and most enthusiastically praised. This is a sheer fabric on the same order, combining a plaid ground, covered with printed floral effects in two colors.

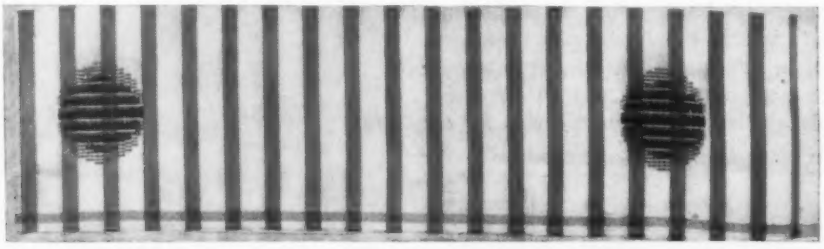

FIG. 3

Among the domestic productions worthy of note are printed batiste. The effects are in white and printed grounds, 31 inches wide at 29 cents per yard.

The Arnold Print Works have met with a deserved success with their mercerized eolienes, sold by jobbers at 32 1/2 cents. Fil de soie at 17 1/2 cents. Arnold taffeta at 9 1/2 cents.

The Aberfoyle Mills, selling through Galey & Lord, are showing an embroidered cotton voile, sold by jobbers at 12 1/2 cents less 5 per cent. Shimmer silks at 18 cents, and silk radiant at 37 1/2 cents.

WHITE GOODS.

The advance orders placed on white goods is unusually heavy, although the white craze no longer dominates the market as it did a few seasons ago, but the yardage sold is satisfactory to the manufacturer as well as the importer. Fabrics on the order of the mer-

cerized Jacquard weave are not as strong as last season, although the quantity sold is very extensive. Staple India linons, Persian and French lawns are well sold up.

Fancy piques, Oxfords and canvas weaves are also maintaining their popularity.

LININGS.

Converters claim that their branch of the business leaves much to be desired, but during the month mercerized satins show material improvement and those houses that make a specialty of this cloth have booked substantial orders. Silesias have been bought by the clothiers to some extent with very little demand from the retailer. Percalines have been fairly well taken by the Pacific coast trade, and as spring approaches the request is likely to become more general.

Frederick Butterfield & Co. report a satisfactory business on Bengaline moreen at 22 1/2 cents and Manhattan silk at 15 cents.

The Gilbert Mfg. Co. state that their business on pres de sore is fully up to expectation.

Burton Brothers' "Lustrail," a highly finished mercerized sateen at 25 cents, is meeting with continued favor and duplicate orders are being freely received.

THE SOUTHERN COTTON ASSOCIATION.

The convention of Southern Cotton Growers at New Orleans last month resulted in the organization of the Southern Cotton Association. Harvie P. Jordan of Monticello, Ga., was elected president. The means suggested by the convention to advance the interests of the planters is outlined in the following resolutions:

Let the people of the cotton States assemble in the county seats of their respective counties on the 11th day of February at 1 o'clock P. M., 1905, and elect a county chairman, and a precinct chairman for each school district or other smallest political subdivision of that county. On the 18th day of February, 1905, at 1 P. M., there shall be held a meeting of all citizens of every school district, who shall elect a committee of three on acreage and membership. This committee shall immediately require the signature of every cotton planter in that subdivision to a pledge to reduce his acreage twenty-five per cent. under the acreage of the previous year.

The convention calls upon every merchant and banker throughout the cotton States to refuse to extend credit for money or supplies to any planter who does not sign the pledge to reduce his acreage.

It calls upon the cotton planter of the South to hold his cotton on his own farm, steadfastly refusing to sell for less than ten cents a pound, at the ports of Galveston, New Orleans, Mobile, Savannah, Brunswick and Charleston.

It calls upon the planters of the cotton belt to co-operate with the Bureau of Statistics of the Department of Agriculture by furnishing, through the county sheriff, to the State commissioner of agriculture, accurate and reliable statistics of the cotton crop; and it further calls upon the commissioners of agriculture to transmit the same to the chief statistician of the Department of Agriculture.

It calls upon every Southern congressman and senator and upon the President of the United States to use every effort and to spare no endeavor to open to our commerce the markets of South Africa, China, and all the countries of the world, and to that end advocates an increase of the navy.

It calls upon the planters of the South, finally, to diversify their crops, to make cotton a surplus crop, and to place themselves out of reach of the one-crop evil.

This plan of securing higher prices by restricting production is business-like and in line with the methods adopted in other industries, including that of manufacturing cotton into yarn and cloth. It is doubtful, however, if the planters throughout the South can be induced to act together in cutting down the acreage. The territory is too large and the planters are too numerous to make such a result probable without thorough preliminary organization, which would require years of effort under favorable conditions. It is very easy to pass resolution in favor of reducing the cotton acreage, especially with cotton at seven cents, but a sharp advance in price between now and planting time would make the proposition ridiculous to the planters.

The warehouse plan for marketing cotton was discussed at the Convention and a committee was appointed to meet at New Orleans on March 13 to consider the question and formulate methods of putting the plan into effect.

Tertullian, writing in the second century, thus describes the silk worm: "It is a kind of worm which extends abodes like the dials of spiders by floating them through the air. It then devours them so as to restore them to its stomach. Therefore, if you kill it, you will roll living threads."

BALING EGYPTIAN COTTON.

The methods of preparing American cotton for the market are a standing reproach to the United States and can be explained only by the fact that Nature has been so generous in her gifts of cotton to America as to make the cotton planters indifferent to the waste caused by their neglect. We possess and are likely to retain a practical monopoly in the production of cotton, and it is this fact alone that makes it possible for slovenliness to remain the rule in preparing the staple for the market. While Egyptian cotton is much superior to American, the production of the former is, and in the nature of things must, remain small. India, on the other hand, produces a larger crop than does Egypt, but the cotton is short, dirty, and in every way inferior to American cotton. In both Egypt and India, however, the manner in which cotton is prepared for the market presents a striking contrast to American methods. The following letter written by a cotton expert who has recently made an extended trip through Egypt, describes the practice in that country:

Editor Textile World Record:

During my recent stay in Egypt the establishments I visited were those of Carver Bros. & Co., Ltd., the most important house in the cotton business. I found that their system of handling cotton is about as follows: They have established ginning factories throughout the Delta, where the chief crops are grown. The plants are equipped with English roller gins. The machinery is very simple. The gins that I saw were placed in two lines facing each other, and down the centre ran a truck on rails. The cotton was bought from all the surrounding district in the seed and in that condition was graded. When a good batch of one type was secured it was taken to the gins and fed into all of them simultaneously. From this it will be seen that had there been any variation in the cotton in the lint it would have been equalized in the process of ginning.

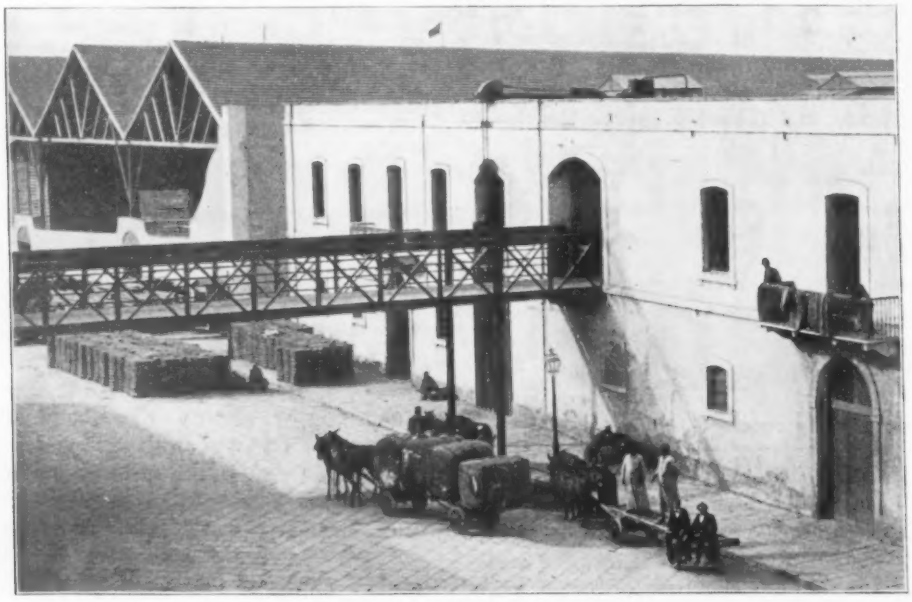

FIG. 1. A COTTON PRESSING PLANT AT ALEXANDRIA.

The cotton is delivered through the gins into the centre alley. The trucks carry the product of the gins to one end in a thoroughly mixed condition. The cotton is baled in a hydraulic press. The bales weigh from 700 to 800 pounds and are much larger than the shipping bales. At Fig. 1 some of them are on a large truck ready for grading and pressing. These large bales are shipped to Alexandria for further grading. They are sampled and those lots which correspond are opened out and thoroughly mixed. The amount

of the mixing varies, but it is not exceptional to have many hundred bales, possibly a thousand, in one blending. After these bales have been opened out and mixed they are repacked into the shipping

FIG. 2. MIXING COTTON IN EGYPT.

bales; these bales also weigh from 700 to 800 pounds each.

The press has a revolving magazine of three bins, two of which are being filled while the third is being pressed. The machines are very powerful, the first pressure being put on by steam and

dropped out of the press complete, with the exception of the sewing on the ends, which is done afterwards. The quality of the burlap and the weight of the bands and hoops run remarkably uniform and average 22 pounds to the bale. The bales are so tightly compressed that it is almost impossible to insert a knife, but this in no way injures the cotton. Fig. 2 shows cotton being delivered from a mixing machine. Fig. 3 shows the mixing for the final pressing. Fig. 4 shows the

FIG. 3. MIXING COTTON IN EGYPT.

finished up by hydraulic. The burlap is much finer than that used on American bales. It is put into the press and the cotton let down on it. While the final pressure is being applied eleven hoops or bands are put on and secured, and the bale is

cotton as it is coming out of the press. I have seen them come out at the rate of 45 per hour, and under favorable conditions 60 bales per hour can be turned out.

By studying this system one will understand the

regularity in regard to shipments of Egyptian cotton. I have never known of any variation in a shipment of Egyptian cotton prepared by this system. Every bale is like every other in the lot, and it will readily be seen it has to be.

Fig. 1 shows one of the large pressing establishments in Alexandria. The large presses in this establishment were first introduced into Egypt by Edmund Carver, of the firm of Carver Bros. & Co., Ltd. The cut shows some of the large

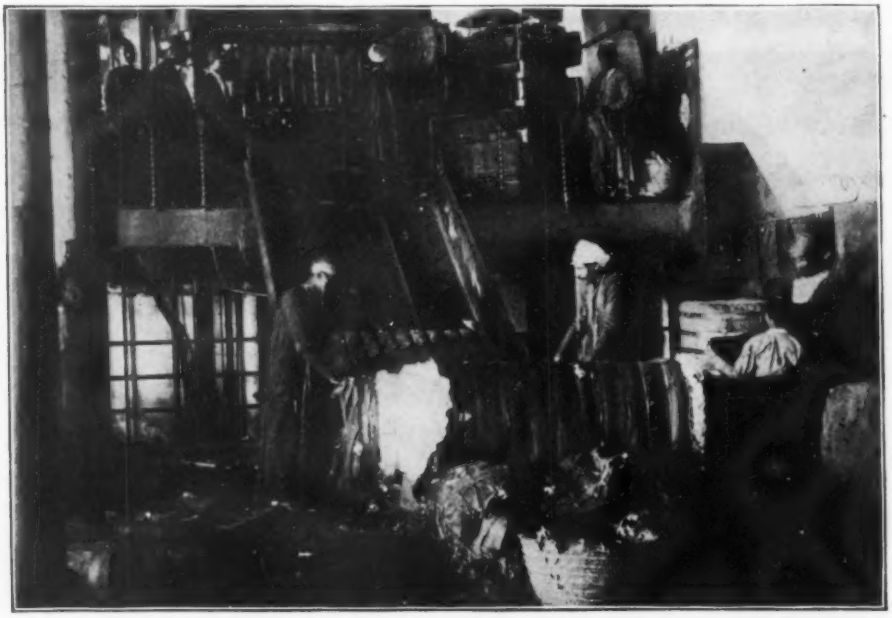

FIG. 4. COTTON COMING FROM A PRESS IN EGYPT.

FIG. 5. EGYPTIAN COTTON AS IT ARRIVED IN BOSTON.

country bales as well as some of the final pressing. Fig. 5 shows Egyptian cotton as it arrives in Boston. It will be seen from this that there has been very little breaking of the bales and very little waste of cotton, and the cotton is so well protected that there is very little injury from being soiled. The bales are all exactly alike and can be easily packed on the steamer or cars.

As far as American cotton is concerned there is great risk in shipping it on account of the miserable way in which it is put together. I have myself seen the deck of a ship lifted up on account of the hoops bursting and the cotton expanding.

King Philip.

HOW TO INCREASE CUBAN-AMERICAN TRADE.

In Cuba commercial relations will always be at the front, the political situation being a question of secondary consideration, and in connection with commerce we must remember that there is no question of sentiment involved, and that the Cuban merchant, be he native, Spaniard, German, or Frenchman, will purchase his goods where, all elements of cost considered, they are the cheapest.

Close commercial relations have existed for years between the merchants of this country and those of Europe, and credits have been extended during that period varying from six to eighteen months on each bill of goods sold. Such relations do not permit immediate separation. Credits covering such length of time are not granted by merchants in the United States. It is useless to argue the point at issue by advancing the reasons why it is not done in the United States. This credit system actually exists in Cuba; under it trade has developed, and it is difficult for a newcomer to change it, unless he offers some great offsetting advantages. Experience, as shown by plain figures, confirms these conclusions, and another year will tell whether or not the present reciprocity treaty affords the advantages needed.

Legislation alone, however, will not bring about the desired result—that is, a large increase of American trade; the active cooperation of our manufacturers is needed. Their representatives here should be men well acquainted with the goods they are selling and able to speak the language of this country (Spanish), so as to point out the superiority of the products of our soil or factories personally, instead of through a hotel guide or interpreter—a man without knowledge of the goods offered and usually insufficiently instructed in our language to interpret properly what the agent desires him to say.

The commercial houses of Cuba are, as a rule, of long standing, and their financial responsibility can easily be ascertained. If it is found satisfactory, credit, say for ninety days, should be extended, as, in comparing the respective cost of the article sold by American merchants and by European houses at long credit, the value of money here, that is, rate of interest charged (from 8 to 15 per cent.), must be taken into account.

The following information has been collected largely from Messrs. Molina Brothers, custom-house brokers, in this city:

All goods arriving in the island of Cuba, whether dutiable or not, must be entered in the custom-house of the port of arrival. The entry is made on a prescribed form, which is accompanied by the invoice or bill of sale, and the bill of lading issued by the carrying company. Both the bill of lading and the invoice must be in exact accordance with the goods they cover.

Great care should be exercised in making invoices to conform to the customs regulations, for if they are not properly prepared the entry is delayed, heavy fines are imposed (if not confiscation), and the merchant is at a loss to know what the goods are going to cost him; and besides, risks losing sales on account of late delivery. Several instances are known of merchants ordering from Europe, simply because European manufacturers comply with their instructions and present invoices properly made, thereby insuring the dispatch of their goods within the specified time of eight days after arrival. The customs regulations of this country are identical with those of the United States, and intending shippers should consult them, or employ experts in export trade in order to have invoices properly made.

The invoices must be made in quadruplicate, on good, durable paper, with ink, and

must give the value of each article they cover, its gross and net weight, a description of package (if it is case, barrel, bundle, crate, etc.), and its gross and net weight. If packages are marked and numbered it should be so stated on invoice; all vague terms, such as fittings, machinery, supplies, should be avoided; everything should be clearly described. On invoices covering textiles it is absolutely necessary to state whether they are cotton, linen, wool, or silk. On invoices of such goods as hoisery, the net weight of the pasteboard boxes, the weight of the wooden box, and the total weight of all must be stated. Other requirements for various classes of goods are given below. In brief, goods should be so clearly and definitely described on the invoice that one can readily learn the number of packages, their marks and numbers, gross and net weight, and exact contents—quality, value, etc.—without the necessity of opening or seeing the packages.

The expenses incurred, if any, such as packing and boxes of cartage, should be stated, but not the steamer freight from the shipping port. If there are no charges the fact should be indicated by the letters "f. o. b." The invoices should state whether goods are products of the United States of America, and must be signed in ink by the firm. In case the shipper is a company or corporation, the title of the signer should be given (for example, American Paper Company, by John Smith, secretary). No initials will be accepted. Invoices must be clean and free from erasures and corrections.

These four invoices are presented to the Cuban consul, who will certify and return two of them to the shipper. The two returned to the shipper are then sent to consignee, with the bill of lading, by the same steamer that conveys the merchandise. The bill of lading should give clearly the number of packages, gross weight only, and their mark and number, in full conformity with the invoice, and should state to whom they are consigned. If the bill of lading is to "order," it must be indorsed by the shipper, otherwise the custom house will not deliver the goods.

I have prepared a pro forma invoice, showing how it should be made, if several articles are put in one package. It must be described as 1 box, barrel, etc., of sundries, gross weight must be given, and each article it contains must be described, somewhat as follows:

SAMPLE INVOICE.

One box sundries, containing :—

Weight.	Articles.	Value
5 pounds	5 pounds white beans, at 2c per pound	$0.10
½ pound	1 pair men's black leather No. 9 shoes	3.50
10 pounds	1 shotgun	25.00
5 ounces	1 nickel-plated watch	5.00
½ pound	1 dozen hemstitched cotton handkerchiefs (white) 20 by 20	6.00
5 pounds	1 nickel-plated brass shower for bath	5.00
		44.60
	Charges: Boxing, 50 cents; cartage to steamer, 40 cents	.90
		45.50

Gross weight of box, 47 pounds.

Net weight of box, 22 pounds.

I certify the above are products of the soil or industry of the United States, and that this invoice is true and correct in all respects.

Samples.

(Signed) JOHN DOE.

REQUIREMENTS ON INVOICES OF DIFFERENT GOODS.

Cotton or linen goods: If white, colored, printed, dyed, open work; number of threads.

Silks: Net and gross weight and value only.

Woolens: Net and gross weight and value only.

F. STEINHART,
Consul-General, Havana.

About the middle of the seventeenth century the Paisley shawl was the universal bridal present in Scotland, and in many places it was the fashion for all newly-married women to be "kirked" in a Paisley harness plaid, quite irrespective of the state of the weather.

During the commercial depression in Paisley in 1842, Queen Victoria purchased seventeen Paisley shawls from the manufacturers and wrote that she would wear one of them at the royal christening, that of the present King Edward.

MECHANICAL COTTON PICKING.

BY J. T. BROADBENT,
Head of the Carding and Spinning Department, Fall River Textile School.

The preparation of this article at this time was suggested to the writer by the following statement taken from a recent publication:

"It must be conceded that the cotton growing States are confronted by a serious labor problem, and that until some solution is found the resources with which nature has endowed the American cotton belt cannot be even approximately applied to the production of cotton. Vast sums of money have been spent by inventors and investors in a multitude of attempts to produce a practical cotton picking machine. At this time, so far as public knowledge goes, successful consummation of their labors remains as distant as ever.

"In these days of wonderful inventions and discoveries, one cannot believe the cotton picking machine an impossibility. Not even an improbability. Too rich a reward is in store for the genius who first reaches the goal."

Considering the many predictions and attempts that have been made to furnish a machine as a substitute for the negro as a cotton picker, it is not surprising to find that the above represents the opinion of a great many people on this matter.

The statement I have quoted is undoubtedly true in connection with the expenditure on the various attempts made to produce a practical cotton picker, and also in regard to the reward for the inventor who first attains this result; but whether such result is as distant as ever is very questionable.

It is also true that many mechanical appliances have been tried. In fact, it has been sought by some to depart from the mechanical methods, and introduce the novel idea of training monkeys to perform this work.

Realizing that a mechanical cotton-picker to be successful must have the power of selecting and clearing the fibres from open bolls, without damaging the closed or immature bolls and at the same time gather as little leaf and plant as possible, it may be safely assumed that the perfection of such a machine will almost equal in importance to the southern planter the invention of the cotton gin and assist in further establishing the supremacy of the United States as the leading cotton producing country in the world.

That mechanical cotton picking has engaged the efforts of inventors for practically the last half century will be seen by reference to Fig. 1, which represents one of the first attempts, although a patent was issued in 1850 to Rembert and Prescott of Memphis, Tenn., for a machine much on the same order as the one shown in the figure. This patent was possibly the first ever issued on a mechanical cotton picker. The patent for the machine shown in Fig. 1 was issued to G. A. Howe of Worcester, Mass. It was a hand machine and consisted of a specially constructed wire belt with wire teeth projecting on one surface of the belt.

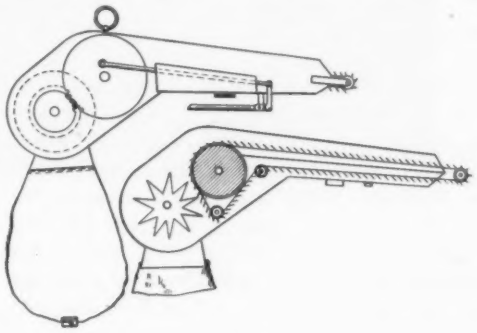

FIG. 1.

The endless belt was mounted on two pulleys. To one of these pulleys was attached a crank to be operated by the hand, thus causing the endless belt to travel over the pulleys. The operator of this machine was expected to attach it to his body in such a manner that the pulley, to which the crank was attached, was near him and the other end of the endless belt was placed in contact with the boll to be picked. On turning the crank the belt with projecting teeth would engage the cotton and carry it to the upper end of the device and deposit it in a sack also attached to the operator.

Several patents have been granted for hand machines of this type. The same device of an endless toothed belt has been in various ways attached to wagons with the idea of facilitating the operation, the latest attempt in this direction having been made by George H. Lowry of Boston, Mass. His

machine consists of several of the hand machines described above mounted on a wagon carrying an operator for each belt.

Another type of machine for which many patents have been issued depends upon suction created by pumps or fans with tubes branching out of the exhaust chamber and an operator for each tube to make contact with the boll selected for picking. Both these types of apparatus are essentially adjuncts to hand picking, since there is hand manipulation for every boll picked. Their speed and capacity are limited by the individual powers of the operator. It may be questioned whether an active hand picker will not reach more bolls in a given time with his own hand than he will when he has to apply some mechanical device to each boll.

It need not be emphasized, however, that no cotton picking mechanism holds out any promise of commercial value ,unless it can offer such economies as to make the operation profitable after a liberal allowance for deterioration of sample or for cost of subsequent cleaning so as to bring cotton up to grade of careful handpicked in freedom from leaf and trash.

In addition to the above the successful practical mechanical cotton picker must be able to make steady progress along the row and pick from a number of bolls simultaneously and at the same time entering the plant and exploring it so thoroughly as to engage and extract from the bolls all ripe cotton and perform this operation automatically. It must differentiate between ripe and unripe bolls, picking the former and leaving the latter uninjured. It must be able to gather all the cotton borne by the plant, whether one boll or one hundred, not only late in the season when the leaves are gone, but also when the plant is so covered with leaves that many bolls cannot be seen. It must automatically strip the pickers of the cotton gathered by them, collect the yield and discharge it conveniently, so that the machine may be kept in continuous operation.

About two years ago the result of several tests made with a bale of machine picked cotton was published in the Textile World, and while the per cent. of leaf, etc., was larger than from the average hand picked cotton, it will be remembered that the bale tested was one of the first, and one of the worst picked by the machine. The bale referred to was picked by a machine invented by Angus Campbell and now owned by the American Cotton Picker Co. of Pittsburg, Pa. Its development is under the supervision of the inventor, who by constant effort and costly experiments has improved considerably upon the machine as used when the bale referred to was picked.

Satisfactory results as regards the cotton picking mechanism were obtained long ago and for several years past the experiments of the company have been concentrated upon details of construction, so as to determine questions of size, weight, traction, etc., which must be worked out in perfecting a pattern for ordinary commercial use.

Fig. 2 gives a side view of Mr. Campbell's machine at work in the field. This machine is of the 1903 pattern, which has been improved upon considerably, with the result that the 1904 machine has been reduced in weight and a rearrangement of the driving mechanism made, rendering the machine less cumbersome. The 1904 machine is shown at Fig. 3, the same style of machine is also built to be driven by mule power. In the latter the picking mechanism is operated through gearing connected to the axle of the rear wheels of the machine. The front wheels being used for carrying and steering purposes only.

The machine used this year in field tests moves by its own power, and was attended by one man and a boy. It performed its operations equally well at any rate of speed. Upon one occasion it moved over one row in 3 3/4 minutes, gathering 71 pounds, 8 ounces of cotton. This row was timed without any notice to the operator and is the ordinary rate of speed at which the machine operates. After the machine had passed over the row once, the baskets were emptied and the machine passed over the second time. Then every seed of cotton re-

maining on the row or fallen to the ground was picked by hand. Each picking was weighed separately and resulted as follows:

First picking	71 lbs. 8 oz.	92.8%
Second picking	4 lbs. 1 oz.	5.2%
Gleaned off row and ground by hand ...	1 lb. 8 oz.	2.0%
Total	77 lbs. 1 oz.	100.0%

plants were broken at about 4 feet above ground. These plants were from six to eight feet high, dense in growth. The conditions under which the machine is tested are design-

FIG. 2.

edly more severe than are likely to be encountered in ordinary use, but the entire percentage of loss would not be over 1 1/2 per cent.

Three samples were taken to Mr. Frazier,

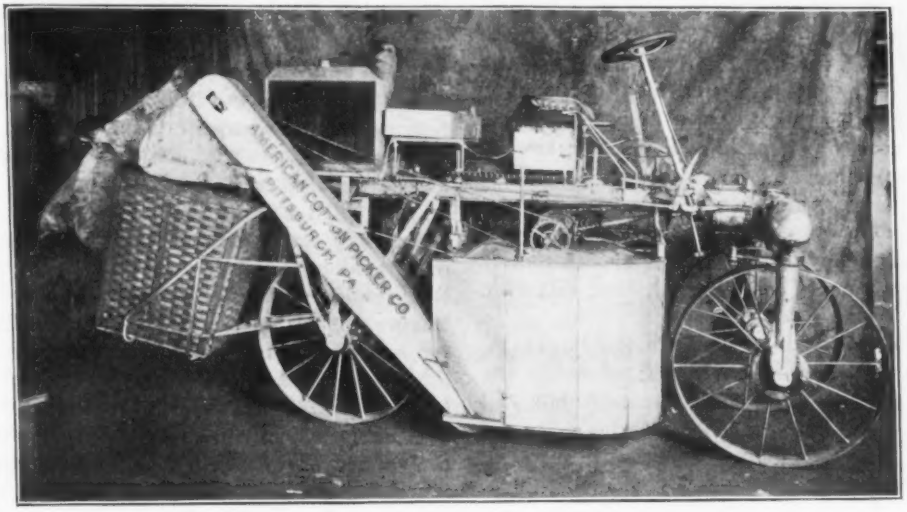

FIG. 3.

In going over the row, the machine knocked off a green boll here and there, a loss computed at 1/3 of 1 per cent. Some

an English buyer at Shreveport; one was of cotton picked by the machine early when the plants were covered with green leaves, an-

other of cotton picked by the machine at a later date when most of the leaves had dropped off, and the third was taken from a bale of custom ginned cotton which happened to be going through the gin, and of course was hand picked. The three bales received the same grading and brought the same price.

Mr. Frazier upon being asked which was the cleanest sample, selected the hand picked cotton, but remarked:

"The difference is so slight that it can make no difference in price."

The actual picking of the cotton from the plant is accomplished by means of a series of metal fingers or spindles, which penetrate the plant, and while doing so are given a rotary motion which together with the special formation on the surface of the spindles, causes the fibres to be wound around the blade of the spindles with sufficient firmness to adhere to them when they are withdrawn from the plant.

The first machines were constructed to be operated entirely by mules, but owing to the fact that considerable cotton was knocked from the bolls by the mules while pulling the machine, it has been found that the application of a small engine for furnishing the power entirely overcomes the difficulty, and as a result the 1904 machine is so equipped.

All machines, however, are provided with arched axles for straddling the row of cotton plants. The picking mechanism is arranged in the drum or box shown beneath the machine near the ground. There are two of these boxes, one on each side of the machine, directly opposite each other. A plan of these boxes is shown at Fig. 4. During the operation of picking the cotton, they are passed on each side of the plant in the direction shown by the arrows, E.

While the plant is between the boxes, A, the fingers or needles, B, will penetrate the plant in such a manner that an open boll will scarcely ever escape contact with some of them. The needles are steel, with a spring temper, which thus makes them flexible. They are provided on one side with a row of fine teeth, which are inclined toward the point or free end of the needle, to facilitate the stripping of the cotton from them, after being withdrawn from the plant. The points of the teeth are turned down slightly to prevent them from adhering to anything but the fibre.

The needles themselves are supported in carriers as shown at Fig. 7, of which there may be from 17 to 19 on each side of the machine. These are linked together to form an endless series, and arranged to travel in an oblong course, and in the direction indicated by the arrow F, Fig. 4, while the speed at which they travel is calculated to equal approximately the forward motion of the machine, so that the needles are practically stationary in relation to the plant.

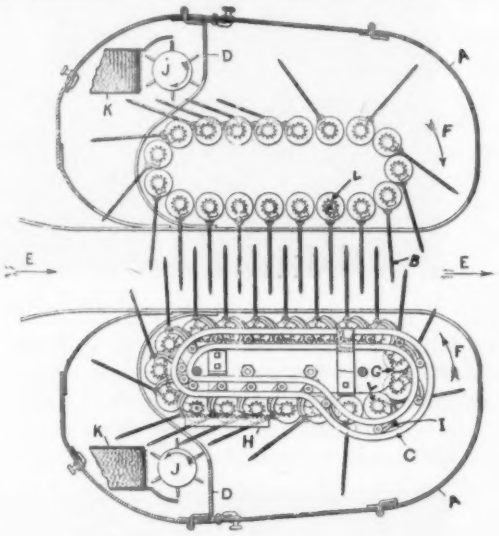

FIG. 4.

By reference to Fig. 4 it will be seen that as the needles approach the plant they are held in such a position that they enter the plant point first. This prevents any slapping or thrashing of the plant. While in the plant they remain in an extended position; and, on leaving the plant they are withdrawn longitudinally in order to prevent unnecessary breakage of the plant. The method of obtaining this change in the position of the needles is by having an arm on the end of the carriers, see I, Figs. 4 and 5, which supports a cam roller, the latter running in the course of the cam C. The needles are made to revolve several times while in the plant, so that they could collect the fibres with which

they came in contact. This is accomplished by having each needle secured to a small gear as shown in Fig. 6, to which motion is imparted as follows:

The gear L, Figs. 6, 7, 8, is mounted upon

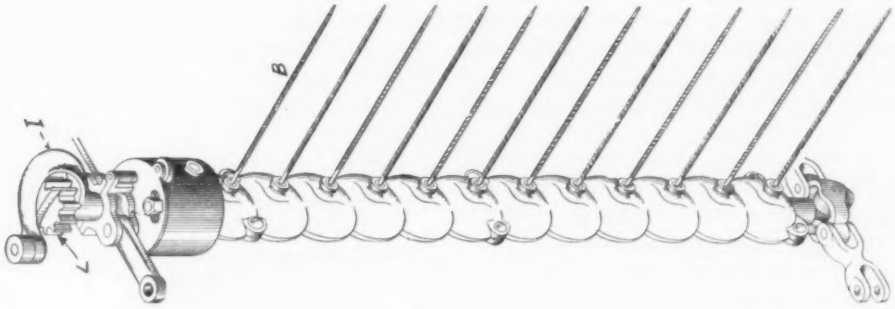

FIG. 5.

a short shaft, R, upon which is also secured the bevel gear, M.

Just before the needles enter the plant, it will be seen that the teeth in the gear, L, are brought into mesh with the teeth on the rack, G, Fig. 4, and as the rack is stationary the forward motion of the needle carriers causes the gear, L, to revolve; this also rotates the bevel, M, Fig. 6, and imparts motion to the gear, N, on the small shaft, P, which carries the gear, O; the latter driving the gears, S, to which the needles are secured.

The gearing is arranged to give the needles about 15 revolutions during their passage from front to back of the machine.

When the needles have been withdrawn from the plant they are carried backwards until almost in contact with the spiked roll, J, when they are again revolved by means of the rack, H, Fig. 4, but in the opposite direction to that obtained from the rack, G. This reverse motion assists in clearing the cotton from the needles, which is performed by causing the needles to recede through grid shaped casing or stripper, D, from which the cotton is taken by the spiked roll, J, and deposited upon a card apron or belt, K, the latter acts as an elevator for carrying the cotton up the inclined trunk, T, shown at the side of the machine, Fig. 5, and from which the cotton is dropped into a basket or bag provided for this purpose.

The picking, stripping and elevating mechanism can be raised and lowered easily while the machine is in motion to suit the conditions of the ground and plant.

However, the question of whether it is possible to harvest a cotton crop by machinery may be answered by the following facts:

1. The Campbell machine in actual field tests has proved that it will gather more than 90 per cent. of all the cotton on a row by passing over it one time.

2. That the machine will do this with very little more injury to the plants than the hands do.

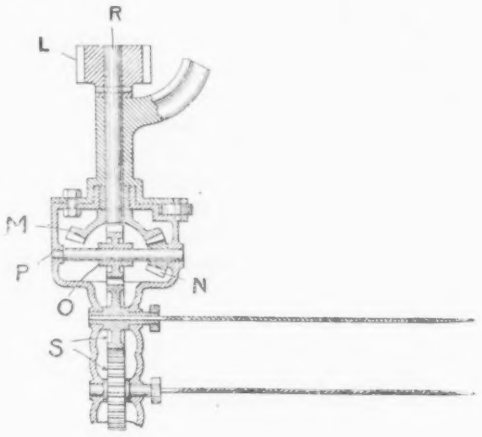

FIG. 6.

3. That the above is accomplished while the machine is moving at the rate of from 2 1/2 to 3 miles an hour, whether the field contains a quarter of a bale, or a full bale to the acre open.

4. That the grade of sample after passing through the cleaner will grade with the average handpicked cotton.

The above is supported by the report of the Board of Directors at the Cotton States and International Exposition Co., Atlanta, issued in 1895. While the report was made several years ago, it must be remembered that this was the first time that a machine in continuous motion had picked the cotton from a row of plants successfully, without injury to the plant or green bolls; and although the amount of cotton in the Exposition grounds was not large, the machine picked enough to demonstrate and justify the statement that it was a successful machine, yet the tests were not long enough to develop its mechanical faults. It remained for these to be developed during actual field tests. Only one of these could be made each year owing to the fact that the construction of the machine is such that a change in detail only might necessitate the rebuilding of the entire machine. For instance, a small change in the needle bearings necessitated the making of 1,500 parts for one machine, which it will be readily understood could not be accomplished before that year's picking season was over.

Under such circumstances the inventor and also the American Cotton Picking Co. are to be congratulated upon the results thus far obtained in perfecting their machine in such a short time after its introduction.

Some idea of what such a machine means to the cotton industry of the United States in particular, and the world in general, can be obtained from the following:

The cost of picking cotton by hand ranges from 40 cents to 75 cents per hundred pounds, although as high as $1.25 per hundred has been paid in Texas during the present season. As two-thirds of the "seed-cotton" by weight represents seed, it will require at least 1,500 lbs. to be picked to make a bale of standard weight of fibre, viz.: 500 lbs. Assuming a price of 50 cents per hundred pounds, it would cost at least $7.50 to pick a bale of fibre, and in many cases this would be increased to $8.00 or $9.00.

In comparison with the above, the machine tests show a production of 71 lbs. in 3 3/4 minutes, but let us assume 70 lbs. every four minutes, with an allowance of 25 per cent. for time lost during the day, and the working day to equal 10 hours.

Then $10 \times 60 = 600$ minutes and $600 - 25$ per cent. $= 450$ minutes actual time to be calculated upon. Again if 70 lbs. are gathered in four minutes, $70 \div 4 = 17.5$ lbs. per minute. This gives a total production per day of (17.5×450) 7,875 lbs.

The cost of running the machine for one day is as follows:

One man	$2.50
One boy	.75
Gasolene, 15 gals. at 15c.	2.25
Machine oil	.50
	$6.00

This is equal to ($6.00 \div 78.75$) 7.62 cents per hundred lbs., or (7.62×15) practically $1.15 per bale, less than one-sixth of the cost by hand picking.

This means that a crop of 12,000,000 bales could be harvested for approximately $14,500,000, instead of $120,000,000.

Again assuming the average weight of hand picked cotton to be 150 lbs. per day of seed cotton per picker, and the picking season to cover 80 working days, it would require 1,500,000 people to gather a crop of 12,000,000 bales.

In gathering the same crop with machines of the capacity given, viz., 7,875 lbs. of seed cotton per day, allowing the same number of working days, each machine would pick 630,000 lbs. or 28,572 machines would be required to harvest the crop, and with two persons to each machine 57,144 persons would be required; thus releasing over 1,440,000 of the force required to pick the cotton crop by hand.

Raw cotton was first exported from Egypt to England in 1823.

The first cotton mill in Rhode Island was built by Samuel Slater in 1790 and at present over one-third of the cotton spindles in the United States are located near the original Slater Mill.

FINISHING WOOL AND MIXED FABRICS.

XXVI.

BY N. REISER.

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MEASURING AND FOLDING MACHINE.

Fig. 126 shows a measuring and folding machine built by the Zittau Maschinenfabrik.

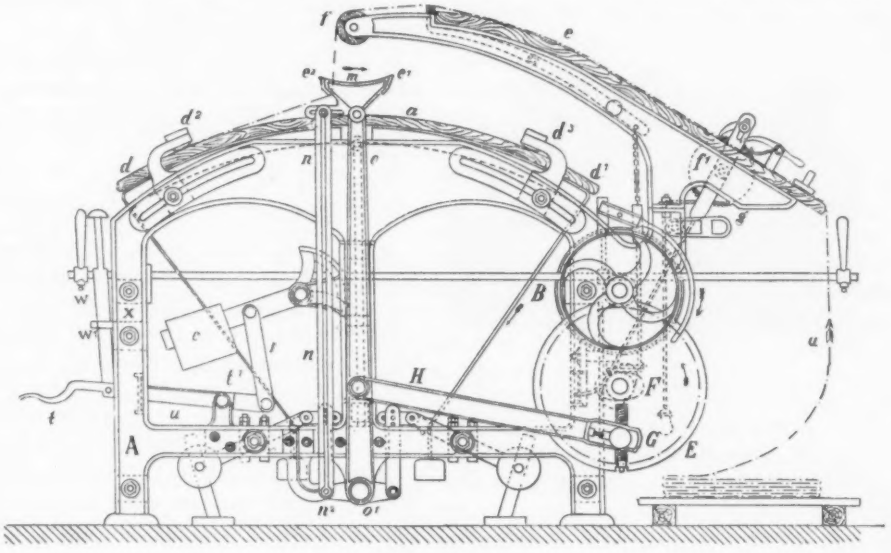


FIG. 126.

A wood table, a, of the width of the goods to be handled, is fastened to a cast iron frame,

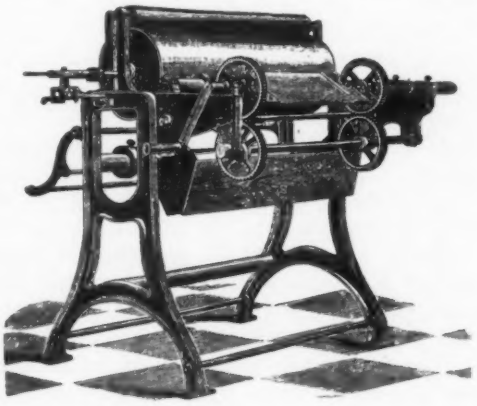


FIG. 127.

A. The cloth is laid on the table, a, by the vibrating lever, o. The table, a, is easily adjustable to the frame, A. The table is balanced by the weights, C, so that the table has a tendency to rise. The goods are laid on a platform at the right side of the machine, and pass over the wooden table, e, the latter being fastened to an arm of the machine frame. The cloth passes over the guide roll, f, and then between two iron plates, e^1 and e^2. These plates are fastened to the end of the lever, o, by means of the plate, m. The cloth passes from one side of the table, a, under the wooden rim, d^1, which is covered with fine wire on the under side in order to hold the cloth as the table presses against this rim. As soon as the swinging lever, o, moves to the left it carries the cloth with it and lays the cloth on the convex table, a. Meanwhile the plate, e^1, passes under the rim, v, on the left side of the machine, the latter being also covered with wire clothing on the under side. As the axes, o^1 and n^2, and the levers, n and o, are fastened to the frame, the plate, m, will move with both bars and the bar, e^2, will carry the cloth under the rim, d^3, as soon as the levers reach the limit of their vibration to the right. The bar, e^1, will press against the table and shove the cloth under the rim, d, when the levers, n, and o, reach the farthest point of vibration to the left. At the end of the operation when the whole piece has been folded, the lever, t, is pressed down, raising

the weight, c, and thus releases the pressure on the table whereupon the cloth is easily removed.

MEASURING AND WINDING MACHINE.

Fig. 127 shows a machine for measuring and folding or winding cloth. The cloth passes first over bars so as to bring the fabric between the light and the operator, enabling the latter to inspect the goods. The cloth next runs over a cloth covered roll. The machine can be driven either by hand or power.

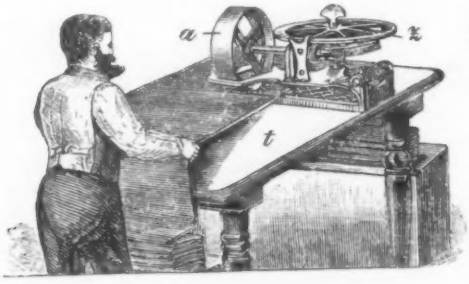


FIG. 128.

Fig. 128 shows another style of machine. The cloth passes in either single or double folds over the table, t, and under the wheel, a, which is connected by a worm gear to the measuring dial, z.

Fig. 129 shows a measuring device invented by F. C. Stevens in Crimmitschau, and

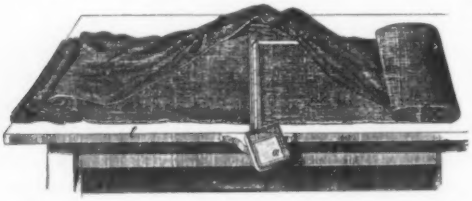


FIG. 129.

which has proved very serviceable. A paper band graduated to indicate the length by any desired system of measuring is rolled with the cloth and cut off at the end of the piece where it indicates at all times the length of the portion remaining on the roll. The band is drawn from the closed holder, a, attached to the wooden arm, h. The band passes to the end of this arm which is near the centre of the piece. The illustration shows the upper part of the cloth drawn back in order to show the wooden arm and the paper band

(To be continued.)

WHY TEXTILE GOODS SHOULD BE ADVERTISED.

This is the twelfth of a series of papers upon textile advertising by Thomas Balmer, advertising manager of the three publications of the Butterick Publishing Company—The Delineator, The Designer and the New Idea.

1. Necessity and possibilities of textile advertising.
2. Naming and trade marking of textile goods.
3. Planning the advertising campaign.
4. General publicity and work upon dealers.
5. Actual experience of manufacturers whose advertising has been successful.
6. Brief comment upon six different lines which will then be discussed, one at a time, in the six following papers based upon actual statistics collected at an expense of thousands of dollars and an equal value for the time demanded for their collection.

XII.

THE GLOVE INVESTIGATION.

The next important department of women's dress which has been the subject of my investigations is that of gloves.

Gloves are not so important an article of women's dress as muslins, silks or woolens, but gloves represent one article which has every characteristic of an article which may be successfully advertised.

A glove is a definite, tangible thing. It may be trade-marked with great ease and the trade mark will remain upon the glove until it reaches the consumer and until the glove is worn out.

There is a great difference in gloves, a wide range of price, and in no one small article of wear is it so necessary that the woman should have the assurance of a good, strong guarantee.

All good houses follow the practice of making good gloves that rip. This is due to the fact that good houses carry their own gloves or gloves of responsible manufacturers who will make good to them any defects in workmanship.

Gloves are a necessity of women's dress, and even a woman of ordinary means who must make her wardrobe last as far as possible is good for at least a dozen pairs a year.

Therefore, an investigation of the demand for gloves by name will be interesting to every manufacturer of gloves, and by inference to every manufacturer of any article of women's wear.

It must be borne in mind in studying the

figures which have been brought together by these investigations that these represent a small fraction of the trade of only a few stores, and that such numbers as 2, 6 and 10 in these tables mean thousands of people in reality. These are mere straws which demonstrate a few facts which I have maintained in theory for years, and which I am now prepared to prove by figures.

The first of these facts is that there is a demand for articles which have been advertised in the right way. The gloves which are most called for over the glove counter are the gloves which have been best advertised.

The fact, however, as shown by one of these tables, that the stores represented sold their own make seventeen times as compared with eleven who sold what was asked for proves that the manufacturers of gloves by not advertising sufficiently are losing trade in the proportion of eleven to seventeen.

It may be argued that the store's own gloves are made by some manufacturer who puts the name of the retailer in the glove he makes, but to this argument I say that if any retail store can build up a good trade on gloves made by a manufacturer, that manufacturer can build up a trade on his own gloves all over the country that will be worth a thousand times as much as the trade of that one store.

A study of these tables will reveal the fact that gloves which have been longest in the market, or which have been advertised to some extent, are the ones that are in demand by name.

Two people asked for Kayser silk lisle gloves. Several years ago Kayser double-tipped gloves were advertised quite liberally, and even to this day some memory of these gloves lingers in the minds of shoppers, and they are called for by name in these tables twice—once for summer wear and once without specifying the reason. It is safe to say that these two calls are the remnants of advertising which was done some time ago but which was discontinued. Undoubtedly if the Kayser people were using space today as they were then, the volume of calls for their gloves represented in these tables would have been considerably larger.

Fowne's is represented by a total of eight gloves as against two calls for Dent's, which latter, of course, are strictly walking gloves, and do not admit of as wide a range of use.

Walking gloves, however, were asked for under the name of "walking gloves" nine times.

Of gloves with a particular quality, gloves that would wash had the largest number of calls, seventeen customers having asked for wash gloves.

The manufacturer of a well-known white washable glove has this to say about washable gloves, which may be of interest:

"Our white, so-called 'washable glove' has all the appearance of a white dressed kid of very soft finish. It is sufficiently porous to be cool for summer. It owes its washable quality to a process called 'boning' known and practiced in France since the days of the first chamois wash glove. It is excellent for skin very subject to perspiration. May be washed either in gasoline or warm soda and water. If the latter, sponge off gently while only slightly soiled, and before taking from the hand. Then fill with air, and fan gently while drying. Every pair of our gloves bears a guarantee. We are fighting very hard against cutting prices. We keep a uniform price to customers, no matter how large the order. Thousands of them are being sold. It is considered the best 'wash-glove' made, but no wash-glove is perfect. The name is somewhat of a misnomer. No kid ever manufactured can be scrubbed with impunity, or successfully washed when the dirt from many wearings has once become ground in. The ——— like any other, should be washed after each time of wearing, or as soon as soiled. The guarantee does not cover perspiration stains, which can never be removed by washing from any glove. This is contrary to the statements made by clerks in many department stores. It is sold with or without trade mark, according to the desire of customer."

The man who made these statements about his glove believes that it would be possible by advertising to popularize such a glove.

This statement about the glove and its peculiarities was made irrespective of the figures shown by the tables following this article.

These figures show conclusively the remarkable fact that seventeen women out of a total of ninety wanted washable gloves. This

fact should also be taken in connection with the still more astonishing statement that no gloves having qualities which make them washable are being advertised, or being advertised, the fact that they are washable is ignored.

Seventeen out of ninety is about nineteen per cent. As these tables were based on average investigations—that is, based upon the first ten women who applied at the glove counter in ten different stores scattered over New York City—it can be safely taken as an average that nineteen women out of every hundred want washable gloves, and that no manufacturer is recognizing this want by the customer asked for the brand," that no advertising.

It is also to be noted, in the column "Why one gives the reason that it was the advertising that led her to buy the gloves. This is very natural as no one manufacturer has ever advertised so that his gloves are stamped upon the minds of the woman shopper as are many other lines of goods.

The possibilities of glove advertising are as great as or greater than that of almost any other department of women's wants. It has the advantage of being an almost untouched field.

Women's shoes are being advertised liberally. Several good brands are using large spaces.

If a shoe can be advertised, certainly a glove can. Gloves and shoes are the marks of a woman's refinement and attention to dress. Neat gloves and neat shoes do more to produce the appearance of being well dressed in a woman than almost any other two articles of dress.

The facts that govern shoes are certainly as difficult as the facts that govern gloves. Fit and style in a shoe are certainly as hard to obtain as fit and style in a glove.

Many large manufacturers of shoes, realizing that women can be appealed to through advertising, and that they can sell their shoes by name and trade mark, are today successfully supplying a large demand. Sorosis, Queen Quality, Regal, Dorothy Dodd and many others will readily occur to your mind.

Why then is it true that shoes may be advertised successfully, and that gloves may not?

These tables prove conclusively that the glove manufacturers are another large department of business men who simply ignore the advertising proposition and refuse to avail themselves of the profits that would come from successful advertising.

Twenty different shoppers asked for eight brands of gloves by manufacturer's name. Seventy different shoppers asked for twenty-one different kinds of gloves without specifying a brand. That is, they asked for "driving, walking, lisle, good kid gloves," and the like. Just as long as three and a half times as many shoppers are compelled to ask for their gloves by description without the great benefit of the name of a well-known brand as a handle, just so long does the field possible to a good glove remain unoccupied. No manufacturer is reaping the benefit of this great undeveloped demand.

It is also to be noticed that in this column of requests by qualities rather than by name, one woman asked for double-tipped and another for double-fingered gloves. These two qualities were the ones which the Kayser manufacturers claimed so strongly at the time of their advertising. The women have remembered the quality, but have forgotten the name, it is so long since any advertising has appeared.

I want to say right here that I think this series of investigations is the most tremendous object lesson ever presented to textile manufacturers, and by "textile manufacturers" I mean every one engaged in making the materials for women's dress or the finished articles. No department of advertising has developed so one-sidedly as the advertising of textiles and women's wear. A few articles are advertised largely, while in many and most cases the most important are advertised very scantily or not at all. Some one manufacturer in each of these great lines is going to see his opportunity, put proper capital behind his advertising, and make a market which no other advertiser can take away from him as long as he keeps up his publicity. If these articles stir only one manufacturer in each line up to a proper appreciation of his opportunities, the net result of advertising in such publications as The Butterick Trio is going to be great, but nowhere near so great as the profitable business thus developed will be to the long-headed manufacturer.

THOMAS BALMER.

GLOVES

1. WHAT SHE ASKED FOR	Total	2. For what purpose?						3. Why did she ask for it?														4. What did you sell her?																												5.	5. Why did you not sell?						
		Unspecified	Summer wear	Street wear	Evening wear	To wash well	Total	Unspecified	Had worn before	Thought it would suit	Saw ad	Liked the cut	Did not know any reliable brand	Durability	Hard to fit	Special sale	To match	To try	Are generally guaranteed	Total	Same as asked for	Own make	Dent's	F. 4 N.	Jouvin's	Regent	Wertheimer	Kayser's	Reynier	New Princess Louise	La Royal	Alexandra	Princess May	Adler's	Vallier	Fownes'	Roullon	Trefousse	Nothing	Total	For detailed analysis see next page.	Did not suit	Do not carry	Too expensive	Color not right	Size not right	Total
Fownes' lisle	1	1					1		1											1																		1	1																		

GLOVES (Continued)

	4. WHAT DID YOU SELL HER?	5. Why did you sell it?																TOTAL
		Phased with previous purchase	Because of guarantee	Best for purpose	Better than Dent's	Better than Fownes'	Perfect fitting	Style suited	We recommended it	Did not have what she wanted	Good for the money	Were on sale	Good quality	Durable	Suited her	Would take no other	No reason	TOTAL	
Same as Asked For	Fownes' silk lisle	1						1							1			3	11
	Viola											1						1	
	Jouvin's wash		1															1	
	Jouvin's $2.00	1																1	
	Dent's walking	1																1	
	Kayser silk lisle							1										1	
	Reynier	1					1											2	
	Princess May								1									1	
Own Make	Mousquetaire								1									1	17
	Lisle											1						1	
	Wash lisle											1						1	
	Silk								1									1	
	Silk lisle										1							1	
	Suède											1						1	
	Kid										1	1						2	
	Riding						1											1	
	Wash					1	1		2			1						5	
	Sale										1	1						2	
	Light							1										1	
	Dent's	1						2											3
	P. 4 N.						1	1	1										3
	Jouvin's						1	3	2							1			7
	Regent								1										1
	Wertheimer							2											2
	Kayser	1							3					1					5
	Reynier	1					1	1	2	1									6
	New Princess Louise										1								1
	La Royal												1						1
	Alexandra								4										4
	Princess May							1											1
	Adler										1								1
	Vallier		2																2
	Fownes'		2					1		1	1								8
	Rouillon			2	1				1										1
	Trefousse							2			1								3
	Nothing																13		13
	TOTAL	7	5	2	1	1	6	16	19	2	7	7	1	1	1	1	13		90

SUMMARY

MAKE OR MATERIAL	Fownes'	Viola	Jouvin's	Dent's	Kayser's	Reynier	Princess May	Own make	P. 4 N.	Regent	Wertheimer	New Princess Louise	La Royal	Alexandra	Adler	Vallier	Rouillon	Trefousse	TOTAL
Sold when asked for	3	1	2	1	1	2	1												11
Sold when not asked for	8		7	3	5	6	1	17	3	1	2	1	1	4	1	2	1	3	66
TOTAL	11	1	9	4	6	8	2	17	3	1	2	1	1	4	1	2	1	3	77

Number of customers who bought	77
Number of customers who did not buy	13
Total number of customers	90

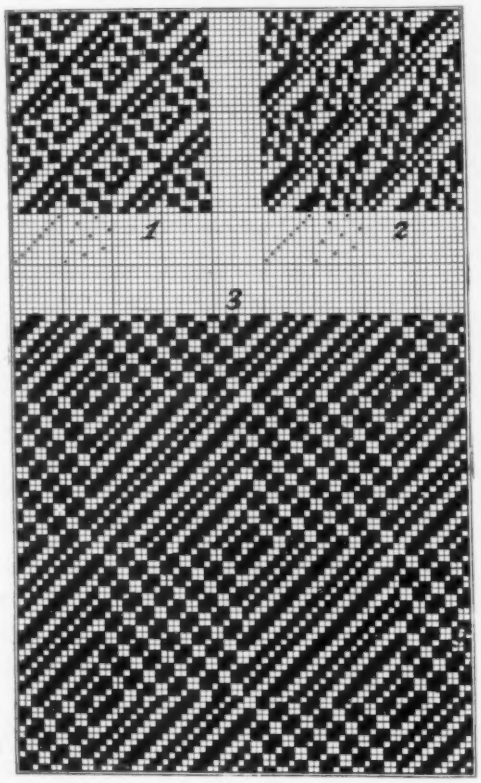
TEXTILE PROCESSES.

EDITED BY E. A. POSSELT.

OUR TEXTILE SCHOOL.

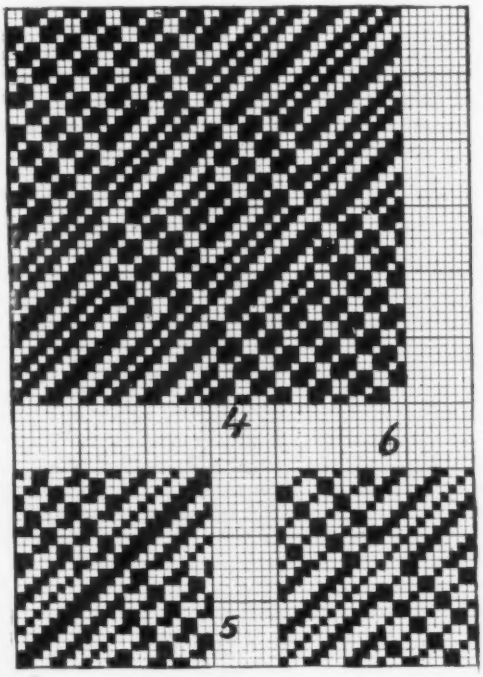
LESSON II.— COMBINING GRANITE WEAVES OBTAINED FROM SATINS WITH THEIR MATE TWILL FOR PRODUCING LARGE DESIGNS.

This system of weaves finds extensive use in the manufacture of cotton, worsted and woolen dress goods for producing what is known as



jacquard imitation effects, for the fact that the resulting weave repeats on a large number of warp threads and picks, which, however, by means of its fancy draw, can be woven on few harnesses, for the fact that the granite weave as well as its 45° twill, as used in the combination weave, have the same foundation, i. e., call for the same number of harnesses for their individual repeat.

In other words, the granite is obtained from the twill by means of a satin draw, and vice versa the twill from the granite by means of a



similar satin draw, and when, consequently, the combination of these two effects in connection with straight draws for the original weave will at once show the student the principle of the combination with reference to few harnesses.

The best plan for explaining the construction of these large weaves will be by means of quoting a few examples.

Examining weave Fig. 1 repeating on 16×16, we find the $\frac{3}{3}\frac{2}{1}\frac{2}{2}$ 8 harness 45° twill, combined with its respective granite weave. Below the weave we gave the drawing in draft, which shows that this weave can be woven on 8 harnesses, viz.: 8 threads straight draw, 8 threads

satin draw, the granite for the first 8 picks being obtained from the twill harness chain by means of the satin draw, and vice versa in picks 9 to 16, the 45° twill is then obtained by means of the satin draw from the granite harness chain, as will be readily understood by examining the weave. By this we mean that when twill is harness chain, the straight draw produces twill effect, and the fancy draw granite effect, and vice versa when granite is harness chain, then the straight draw produces granite weaves; and when in turn the fancy draw comes in action, then said granite chain produces 45° twill.

Using these two combinations against each other will result in the new fancy weave.

Weave Fig. 2 has for its foundation the $_{1}{}^{3}{}_{3}{}^{1}$ 8 harness 45° twill combined with its respective granite weave as obtained by means of a satin draw from the regular twill. Weave Fig. 2 repeats on 16×16, and by means of fancy draw given below weave can be executed on 8 harnesses.

Both weaves, Figs. 1 and 2, have for their method of exchanging granite and twill the common "plain motive," calling for 8×8 threads for each effect.

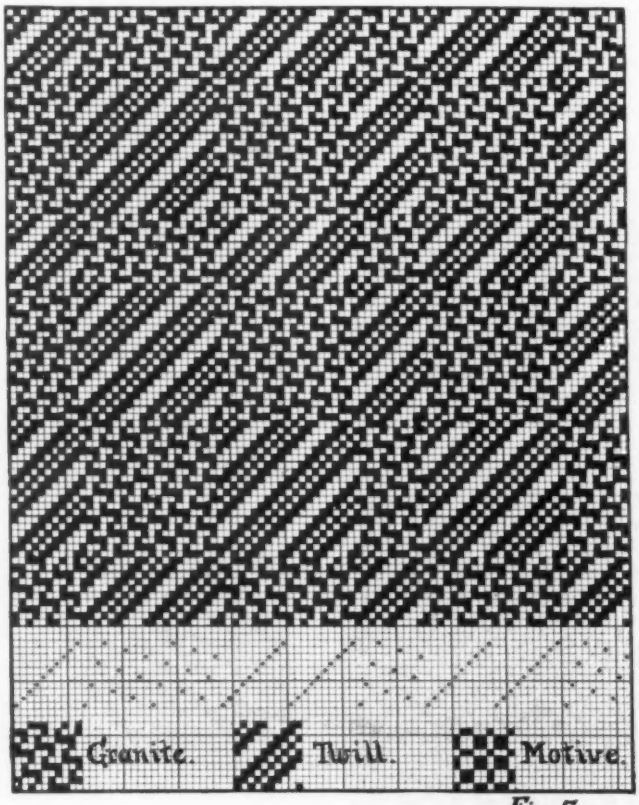
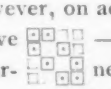


Fig. 7

Weave Fig. 3 repeating on 72×72 has for its foundation the $^{3}{}_{3}{}^{2}{}_{1}{}^{2}{}_{2}$ 12 harness twill, and for its motive of exchanging twill and granite, the $_{1}{}^{2}{}_{2}{}^{1}$ 6×6 fancy basket, giving 12×6=72×72 for the repeat of the new weave, and which, by means of its fancy draw: 12 threads straight draw, 24 satin draw, 24 straight draw, 12 satin draw, can be woven on 12 harnesses.

Weave Fig. 4 repeating on 48×48 has for its foundation the same 12 harness 45° twill as quoted in the previous example, using the same

granite from said twill in the construction of the new weave, which, however, on account of the fancy effect of the motive  —two distinct changes—requires 24 harness fancy draw for its execution, viz.: 1 to 12 straight draw, 13 to 24 straight draw, 25 to 36 satin draw, and 37 to 48 satin draw; using in this instance 12×12 in the new weave, of their twill or granite, in place of one square of the motive.

Weave Fig. 5 repeats on 24×24; and on account of calling for a plain setting, can be woven on 12 harnesses. The foundation twill calls for the $^{3}_{2}{}^{1}_{2}{}^{2}_{2}$ 12 harness 45° twill.

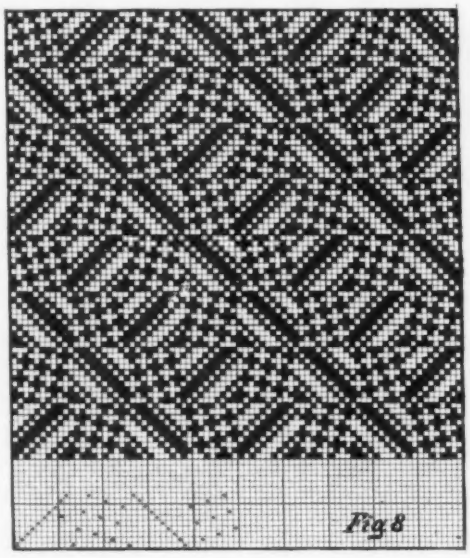


Fig. 8

Weave Fig. 6 is a similar weave as the previous one explained, repeating on 24×24, and having the 12 harness 45° twill—$^{1}_{2}{}^{2}{}_{3}{}^{2}_{2}$ for its foundation—plain setting of effects, 12 harness fancy draw, using 12 warp threads straight draw to alternate with 12 warp threads drawn on satin draw.

Weave Fig. 7 shows a more elaborate combination, the same being the combining of the $^{2}_{3}{}^{2}_{1}{}^{1}_{1}$ 10 harness 45° twill with its made granite weave; both weaves exchanging after the $^{1}_{2}{}^{2}_{1}{}^{2}_{1}$ fancy basket weave for the motive. Repeat of new weave 90×90, and which by means of fancy draw: 10 warp threads straight draw, 20 satin draw, 20 straight draw, 10 satin draw, 20 straight draw, 10 satin draw, can be woven on 10 harnesses.

Until now we always referred to satin draws running in one direction, as shown in connection with weaves Figs. 1, 2 and 7. In some instances a reverse of a satin draw will produce additional new effects, either by means of changing the direction of the twill, or the direction of the satin weave, or both.

In order to explain the subject, the accompanying weave Fig. 8 has been given, and which repeats on 40×40, and by means of its draw, as given below the weave, can be woven on 10 harnesses only. By means of this draw you will notice that both the twills, as well as the satin, reverse direction of twill to suit the fancy combination in the new weave.

CURVED TWILLS.

This system of weaves is very extensively used in connection with other combination weaves in the manufacture of fancy worsted trouserings, as well as dress goods. The smaller effects refer more particularly to the first mentioned system of fabrics, i. e., weaves like Figs. 1, 2 and 3, as given herewith, whereas the more elaborate effects, as shown in connection with weaves Figs. 4 and 5, refer more particularly to the manufacture of dress goods.

With reference to their foundation, these weaves are a combination of regular and steep twills, using in some instances in connection with elaborate affairs for dress goods, also reclining twills; in other words, the weaves have for their foundation 45° twills, using in connection with them the respective 27, 63, 70 and 75° twills, the latter (75°) being little used; however, they will be met with now and then, hence quoted.

The 45° twill is the foundation, and the different drafting the basis for constructing the grading, i. e., the curve of the weave, and which naturally will indicate that this 45° twill will be, in most instances, in connection with fancy effects, the proper harness chain to use, in order to get an easy drawing in draft. In our collection of weaves, however, we made use of the drawing in draft, in order to simplify the con-

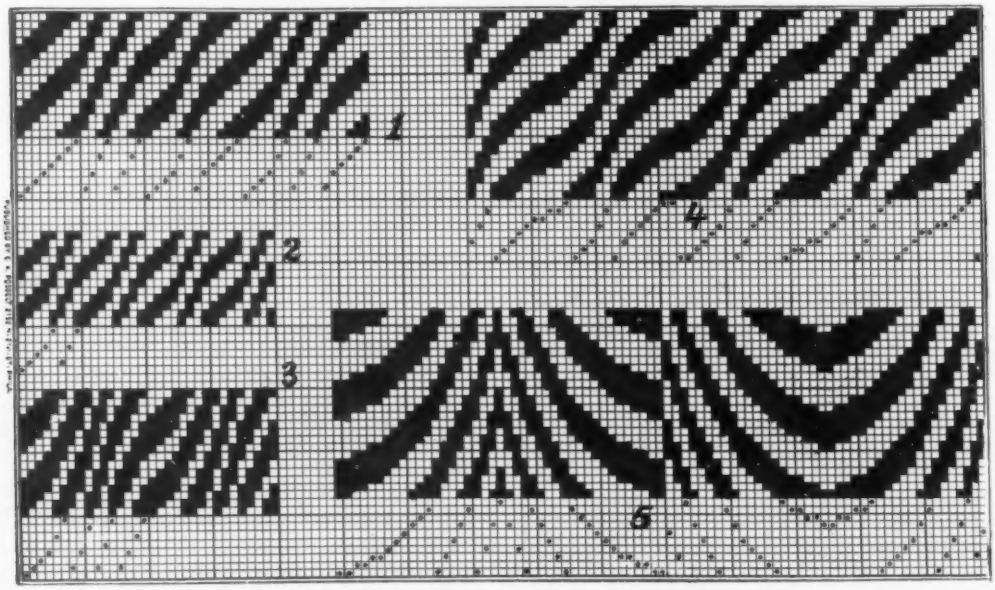
struction of the weaves, showing how they are obtained from 45° twill.

Weave Fig. 1 has for its foundation the $\frac{4}{4}$ 8 harness 45° twill, using in this instance 8 warp threads of the 45° twill, 8 warp threads of the 63° twill, 4 warp threads of the 45° twill, 4 warp threads of the 63° twill, 8 warp threads of the 45° twill, 8 warp threads of the 63° twill, and 4 warp threads of the 45° twill; the complete weave repeating on 44 warp threads ×8 picks, and as shown by means of drawing in draft below weave in dotted type, can be woven on 8 harness fancy draw, the drawing in draft in this instance going with the curve of the weave, a feature which, however, as previously referred to, at the same time applies to each and every curved twill.

Weave Fig. 2 shows another curved twill, having for its foundation the $\frac{3}{3}$ 6 harness twill, using in this instance 4 warp threads of the 45° foundation twill to alternate with 4 warp threads of the 63° steep twill, the weave repeating on 8 warp threads ×6 picks. The draft below the weave has been given to show the construction of the weave only, since in practical work, this weave naturally will be woven on 8 harness straight draw.

Weave Fig. 3 has for its foundation the $\frac{4}{3}$ 8 harness 45° twill, using in this instance 4 warp threads of the foundation twill, 4 warp threads of its 63° twill, 4 warp threads of its 70° twill, 4 warp threads of its 63° twill; the complete weave repeating on 16 warp threads and 8 picks, but which by means of its drawing in draft, as given below the weave, can be woven on 8 harnesses, using the $\frac{5}{3}$ 8 harness regular twill in this instance for the harness chain.

Weave Fig. 4 shows us a fancy effect for dress goods in this line of curved twill weaves, the same having for its foundation the $\frac{4}{4}$ 8 harness regular twill, and which weave naturally in practical work will be the best weave to be used for the harness chain. The drafting of the curved twill from the foundation twill, by means of the fancy draw given, is thus:



4 warp threads 63° twill, 4 warp threads 45° twill, 4 warp threads 27° twill, 4 warp threads 45° twill, 4 warp threads 63° twill, 4 warp threads 45° twill, 4 warp threads 27° twill, 4 warp threads 45° twill, 4 warp threads 63° twill, 4 warp threads 45° twill, 4 warp threads 27° twill, 4 warp threads 45° twill, 4 warp threads 63° twill, 4 warp threads 45° twill, 4 warp threads 27° twill, 4 warp threads 45

twill, the complete weave repeating on 64 warp threads and 8 picks, and which, by means of this drawing in draft, can be woven with the 8 harness fancy draw as quoted below weave, in dot type.

Weave Fig. 5 shows a very neat curved twill for a fancy dress goods effect. This weave has for its foundation the $\frac{5}{3}$ 10 harness 45° twill, the curved twill being obtained from it by means of the following drafting 6 warp threads 27° twill, 6 warp threads 45° twill, 6 warp threads 63° twill, 3 warp threads 70° twill, until now the drafting has been done from left to right with reference to the foundation weave. The last warp thread of the 70° twill being in this instance the point thread, and quoting it again we find the drafting previously used simply reversed, viz.: 4 warp threads 70° twill, 6 warp threads 63° twill, 5 warp threads 45° twill, 6 warp threads 27° twill; now a complete break in the foundation twill appears in the curved twill. Considering the other effect of the curved twill, we find thus: 4 warp threads 70° twill, 6 warp threads 63° twill, 5 warp threads 45° twill, 6 warp threads 27° twill, the last two warp threads of the 27° twill forming again the point for reversing the drafting, and quoting these two warp threads over again, the drafting in the opposite direction from before is thus: 6 warp threads 27° twill, 6 warp threads 45° twill, 6 warp threads 63° twill, and closing the complete weave with 3 warp threads 70° twill, in this instance making again a complete break between the first and last thread of the complete weave, which in this instance repeats on 81 warp threads × 10 picks, and which by means of the fancy drawing in draft as given below the weave in dot type can be woven on 10 harness fancy draw.

Having thus given a complete explanation of the construction of these curved twills, the execution of the lesson herewith given will be of advantage to the student:

(1) Foundation weave $\frac{4}{3}\frac{1}{2}\frac{1}{2}$ 13 harness 45° twill. Draft curved twill thus: 6 warp threads 70° twill, 6 warp threads 63° twill, 1 warp thread 45° twill, 1 warp thread 63° twill, 1 warp thread 45° twill, 1 warp thread 63° twill, 1 warp thread 45° twill, 1 warp thread 63° twill, 2 warp threads 45° twill, 1 warp thread 63° twill, 2 warp threads 45° twill, 1 warp thread 63° twill, 6 warp threads 45° twill, 2 warp threads 27° twill, 2 warp threads, 45° twill, 2 warp threads 27° twill, 1 warp thread 45° twill, 2 warp threads 27° twill, 1 warp thread 45° twill, 8 warp threads 27° twill, 1 warp thread 45° twill, 2 warp threads 27° twill, 1 warp thread 45° twill, 2 warp threads 27° twill, 2 warp threads 45° twill, 1 warp thread 27° twill, 8 warp threads 45° twill, 1 warp thread 63° twill, 2 warp threads 45° twill, 1 warp thread 63° twill, 2 warp threads 45° twill, 1 warp thread 63° twill, 1 warp thread 45° twill, 1 warp thread 63° twill, 1 warp thread 45° twill, 1 warp thread 63° twill, 1 warp thread 45° twill, 1 warp thread 63° twill, 6 warp threads 63° twill, 3 warp threads 70° twill. Repeat of new weave 87×13.

(2) Foundation weave the $\frac{3}{3}$ 6 harness 45° twill; draft the curved twill by using 8 warp threads of 45° twill to alternate with 8 warp threads of 63° twill, the complete new weave repeating on 16 warp threads × 26 picks.

(3) Foundation weave the $\frac{5}{3}\frac{2}{2}$ 12 harness 45° twill, using for the curved twill 6 ends of 45° twill to alternate with 6 ends of 63° twill. Repeat of complete weave 24×12.

(4) Foundation weave the $\frac{5}{2}\frac{3}{2}$ 12 harness 45° twill. Draft thus: 6 warp threads 45° twill, 6 warp threads 63° twill, 4 warp threads 45° twill, 4 warp threads 63° twill, 2 warp threads 45° twill, 2 warp threads 63° twill. Repeat of complete weave 24×12.

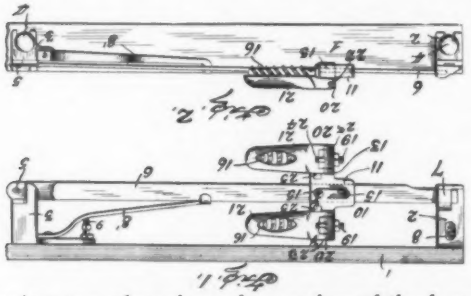
A DOUBLE LOOM TEMPLE.

We illustrate herewith a double loom temple, which will be of general interest to the reader, on account of the novelty of its construction, said temple, although only a late invention, being in practical use.

The purpose of this double temple, in place of the customary single temples used, is to overcome the liability of the temples cutting the filling or chafing the warp, especially on very heavy weaves, said double temple equalizing and distributing the strain upon the temple that the cloth will be properly held,

so all danger of the temples cutting the same is overcome.

In order to better understand the application of the new temple, the accompanying two illustrations are given, and of which Fig.



1 is a top plan view of a portion of the breast beam of a loom, the spring supporting bar attached thereto, and the double temple upon said supporting bar. Fig. 2 is a side elevation of the parts shown in Fig. 1.

A description of the construction of the double temple is best given by quoting numerals of reference accompanying the illustration, and of which 1 denotes a portion of the breast beam to which L-shaped brackets, 2 and 3, are bolted, as at 4, to permit them to be adjusted vertically upon said beam. The horizontal arm of bracket, 3, has a stud, 5, upon which one end of a temple supporting bar, 6, is pivoted, the opposite end of said bar, 6, being detachably engaged with a stop plate, 7, adjustably secured, as at 8, upon the top of the horizontal arm of the bracket, 2. The plate, 7, is adjusted laterally and limits the movement of the bar, 6, in one direction, a flat spring, 8', attached to the bracket, 3, and adjusted by a tension screw, 9, holding said bar against the stop plate, 7.

Slidably and adjustably mounted on the supporting bar, 6, is mounted the double temple, 10, which comprises a block, 11, having a central portion with lateral projections or enlargements, 13, upon each side. The body portion of the temple block, 11, is formed with a slot, through which the bar, 6, projects, and said block is held upon said bar in any adjusted position by set screws, 15. Temple rollers, 16, are attached to each of said projections, 13, and are composed of series of rings, rotably mounted at an oblique angle upon tapered or cone shaped cylinders, which are secured upon the projections, 13, by bolts, 19. Upon reduced upper portions, 20, of the projections, 13, are hingedly secured roller casings, 21, which hold the cloth upon the rollers. Said casings are pivotally or hingedly secured by passing pins through ears, 23, formed at the ends of the casings and engaging opposite sides of the reduced portions, 20, of the projections, 13. The under sides of said ears engage the upper surfaces of the projections, 13, and limit the downward movement of the casing, which in turn are held in their lowered position over the rollers by catches, pivoted upon the tops of the reduced portions, 20, and adapted to be swung over the tops of the casings. In order to guide the casings in their swinging movements and to prevent any looseness of their connections, lugs, 25, are formed on the upper surfaces of the projections, 13, and are adapted to engage the ears, 23.

It will be seen that by employing two temples, one upon each side of the bar, 6, the strain upon them will be equally distributed and the cloth will be so held that all liability of the rollers cutting the same is practically overcome.

DAVENPORT'S TILTING REED MECHANISM FOR CROMPTON & KNOWLES LOOMS.

In weaving chiffon, gauze, veiling, and other extremely light fabrics, a mechanism is provided to the loom for compensating for irregular filling, as well as for a lost pick, the reed being so constructed that it will always spring back a short distance in beating up the filling, except when the filling breaks or runs out, in which case it does not spring back as far, so as to make up for the lost pick.

The object of the new device is to improve upon the mechanism thus explained, by providing means so the filling is beaten up by the reed when it is in a sloping position, the warp threads having a tension sufficient to cause the fabric to slide up the incline made by the reed at each pick.

In case the filling then breaks or runs out,

the fabric then does not slide up the reed as far, thereby making up for the lost pick and preventing thin places in the fabric, the reed at the same time taking an upright position on the lay while the shuttle is passing across.

Of the accompanying illustrations, Fig. 1 is a side view of the lay, the lay sword, reed, as well as the new mechanism, showing also a portion of one of the side frames of a loom, showing the reed in its sloping position. Fig. 2 shows the lay in its rear position with

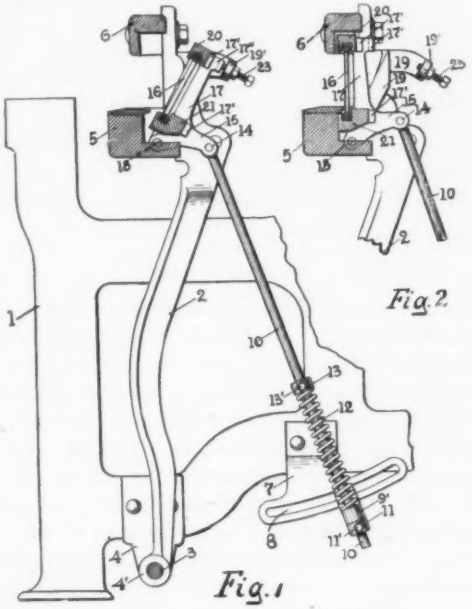


Fig. 2

Fig. 1

the tilting reed in its upright position.

1 indicates a portion of the loom side or frame, 2 the lay sword, mounted at its lower end on the shaft, 3, supported in bearings, 4', on the stand, 4, bolted to the frame, 1. On the upper end of the lay sword, 2, is secured the lay, 5, and the hand rail, 6. Rocking motion is communicated to the lay in the ordinary way.

A stand, 7, having an elongated slot, 8, therein, is secured to the lower part of the frame, 1. A stud extends through the slot, 8, and is adjustably held therein by means of a collar or washer and a nut. Pivoted on the stud, thus referred to, is an arm, having a boss, 9, on its outer end to receive the lower end of a rod or connector, 10. On the lower end of the connector, 10, below the boss, 9, is adjustably secured by a set screw, 11', a collar, 11. A spiral compression spring, 12, encircles the connector, 10, between the boss, 9, and a collar, 13, adjustably secured on the connector, 10, by a set screw, 13'. The upper end of the connector, 10, is pivotally attached to a stud, 14, on a rearwardly extending arm, 15, on the tilting frame carrying the reed, 16. The tilting reed frame, only one end of which is shown in the drawings, has in this instance an end bar, 17, which is pivotally mounted at its lower end in this instance on a stud, 18, in the lower end of a bracket, 19, secured by a bolt to the rear of the lay horn. The top bar, 20, and the lower bar, 21, of the tilting reed frame are grooved longitudinally to receive the upper and lower edge of the reed, 16, and hold the same in the tilting frame. The ends of the bars, 20 and 21, are secured by screws to inwardly extending lugs, 17', on the end bar, 17. The end bar, 17, has an outwardly extending projection, 17'', which in the backward tilting of the reed is adapted to engage an adjustable screw, 23, to limit the tilting movement of the reed. The screw, 23, is in this instance adjustable in and out in an extension, 19', on the bracket, 19.

The operation of the new mechanism is thus: On the rearward motion of the lay, the spring, 12, on the lower end of the rod, 10, holds this rod and prevents its lower end from being moved through the boss, 9, and consequently the tilting reed will be moved from its inclined position (shown in Fig. 1) into its upright position (shown in Fig. 2) preparatory to the throwing of the shuttle. As the lay beats forward, the tilting reed moves with it, and the rod, 10, moves up through the boss, 9, until the collar, 11, engages said boss, 9, and prevents any further upward movement of the rod, 10, so that the rod holds the tilting reed and its supporting frame and brings it into an inclined position, as shown in Fig. 1, as the lay continues to move forward to its extreme forward position. The inclined position of the reed causes the fabric to slide up the incline made by the reed, however, if the filling breaks or runs out, the fabric does not slide up the reed as far, thereby making up for the lost pick and preventing thin places in the structure.

COTTON.

SEA ISLAND COTTON

is the best grade of cotton in the world; such as raised on the islands off the coast of South Carolina and Georgia or directly on the coast, having a staple of from 1 3/4 to 2 1/2 inches. The fibre closely resembles silk, being extremely fine, strong and clean, permitting it to be spun readily into 150's and, if required, can be spun up to 400's for ply yarn. Such of this cotton as grown further away from the coast of Georgia and South Carolina averages from 1 1/2 to 2 inches in length of staple and closely resembles the actual Sea Island cotton, from which it is grown, permitting, if required, its spinning into 150's and up to 200's for ply yarn. Florida Sea Island cotton is grown on the mainland of Florida from Sea Island seed. It has a white, glossy, strong fibre, a little coarser than strict Sea Island, varying from 1 1/4 to 1 3/4 inches in length, and is not as carefully handled during cultivation. It is suited for lower grades of Sea Island yarns spun up to 100's and 150's for ply.

AMERICAN OR MAINLAND COTTON

is the typical cotton of the world grown in what is considered the "mainland cotton belt," which extends from southeast Virginia to Texas, its distribution being mainly between the tide water district and the foothills of the Appalachian mountain system. The deep alluvial soils of the Mississippi valley favor extension of cotton growing much farther northward, from the sugar district of southern Louisiana to the southern border of Missouri, including most of Arkansas and western Tennessee, while the higher elevation of central and eastern Tennessee limits culture and diverts sharply the line of limitation around the foothills of northwestern Georgia.

This cotton is suited for all numbers of yarn up to 50's warp and 80's filling, being clean, regular in length of staple and well graded. On account of these features, as well as the fact that the quantity raised is greater than that in all other parts of the world together, the price of American cotton regulates the price of cotton throughout the world.

Of this American cotton, the Gulf (or New Orleans), Benders or Bottom Land varieties are the most important, varying as to length of staple from 1 to 1 3/8 inches (1 5/8 in special instances), permitting spinning up to 50's warp and 80's filling. Cotton brought in the market as Mobile, Peelers and Allan seed, belong to the same variety and are next in importance, while Mississippi, Louisiana, Selma, Arkansas and Memphis cottons, also belonging to this variety, are slightly inferior. Texas cotton varies from 7/8 to 1 inch in length of staple, and is well suited for warp yarns up to 32's. Next in importance are the Uplands cotton, having a length of staple from 3/4 to 1 inch, permitting ready spinning into 30's filling. Cottons are brought in the market under the name of Georgia, Boweds, Norfolk, or Savannah cottons also belong to the variety of Uplands.

EGYPTIAN COTTON

stands high in the estimation of the commercial world, the success of growing being largely due to the equability of the climate in the delta of the Nile. Of the different varieties grown there, the one known as brown Egyptian is the best, although requiring combing on account of its irregularities of staple. The color itself varies from dark cream to a brown tint, according to soil in which it is grown. The length of its fibre varies from 1 1/8 to 1 1/2 inches and is spun in 50's to 80's warp, up to 100's for filling and up to 120's for ply yarn. It is not as fine as Sea Island cotton, and of course does not bring so high a price, but is better than our mainland cotton, especially for goods requiring smooth finish and high lustre, at the same time giving to fabrics a soft silk like finish, a feature which makes this cotton very desirable for use in cotton mixed silk goods.

PERUVIAN COTTON.

Peru produces a considerable amount of cotton, three varieties being brought into the market, called respectively, Sea Island, Rough and Smooth. The "Rough Peruvian" is the only important variety, having a strong, rough, woolly, crinkly staple, about 1 1/4 to 1 1/2 inches long and is usually very clean and well handled. Its chief use is for mixing

with wool in the manufacture of Merino yarns, for which reason it is called "vegetable wool," and when carded its resemblance is so close and its characteristics so strikingly similar to wool that it could readily be sold for wool, even to a dealer. When woven into goods along with wool, the cotton fibres cannot be determined with any certainty except by using chemical tests. When mixed with wool it reduces the tendency of the goods in which it is used to shrink, makes them more durable, lessens their cost of production, besides giving them a better lustre and finish; hence it is frequently used in the manufacture of underwear and hosiery. For dyed goods it is equally suitable.

GRADING OF COTTON.

There are several principal factors in a good cotton, length of staple, uniformity, strength, color, cleanliness, and flexibility. The first can be found by the gradual reduction of a tuft by the hand until individual fibres are drawn from the tuft, so as to enable their length to be ascertained. To do this well requires practice. In grading cotton from samples not only should its length be ascertained, but at the same time its uniformity of staple. If the staple is uneven, the cotton is of less value than if it were a little shorter, but of greater evenness. The color of the cotton must also be carefully considered, because of the necessity of keeping an even shade of yarn. The cleanliness of a lot of cotton under consideration affects the amount of waste made later on in the mill, being an item of great importance. The amount in a sample is best ascertained by shaking the sample of cotton over a paper and then it will be seen if said cotton contains much dirt or sand. The flexibility of the cotton is best ascertained by the feel, which will show if it is soft or harsh. Flexibility does not necessarily imply a lack of strength, which some might regard as a more essential factor, but rather includes it. A weak fibre would not be a flexible but a brittle one, and without considerable strength, flexibility in the true sense cannot exist. On the other hand, a fibre might be strong and harsh and yet not flexible, being, therefore, not so suitable for spinning.

Warp yarn has to stand considerable strain during weaving, a feature not required by the filling, hence the strongest cottons have to be used for warp yarns. Filling, although required to be made from fibres of proper length and strength, in order not to influence the strength of the fabric, yet requires a soft and flexible fibre. Any attempt to determine the average strength of single fibres in a lot of cotton necessitates the testing of an enormous number of fibres, since a pound of cotton contains at least one hundred million fibres, and the strength of the fibres varies widely.

The classification of our Mainland cottons is generally done by means of 7 full grades, which if required are divided in half or quarter grades, thus giving a chance to grade either by 7 full, 13 half, or 25 quarter grades as the case may warrant.

The full grades are Fair, Middling Fair, Good Middling, Middling, Low Middling, Good Ordinary and Ordinary. "Fair" is considered the best quality, the others varying downwards in proportion, so that "Ordinary" becomes the lowest, or perhaps has the shortest staple, and will chiefly lend itself for the spinning of inferior counts.

The half grades are designated by the prefix "Strict."

The quarter grades are designated by the prefixes of "Barely," meaning the mean point between the half grade and the next full grade above, and "Fully," meaning the mean point between the half grade and the next full grade below.

Sea Island cottons are graded as follows: Extra Fine, Fine, Medium Fine, Good Medium, Medium, Common and Ordinary, which is the lowest priced staple.

Egyptian cottons are as a rule quoted under four or five grades, viz.: Good, Fully Good, Fair, Good Fair and Fair, which is the lowest quality. Between the grades Good and Fully Good Fair there is often an intermediate grade adopted, called Extra Fully Good Fair.

In many instances cotton can be distinguished from wool, silk, flax or hemp by means of the naked eye, again in other cases the microscope will readily reveal its presence, and it will only be necessary to rely on

chemistry in extreme particular cases or when the exact percentage of cotton in a mixture of it with other fibres is required.

To determine the presence of cotton in connection with wool or silk by means of a chemical analysis: The sample must be thoroughly boiled with water in order to extract the sizing and color. When this is done, about 0.1 gram is put in a test glass with 1 c. c. of water and two drops of an alcoholic solution (15-20 per cent.) of a-napthol, and as much concentrated sulphuric acid as there is liquid already. Cotton (as well as other vegetable fibres), if present, are readily dissolved, and the liquid assumes a deep violet color when agitated; wool or silk gives a more or less yellow to reddish-brown coloration.

To ascertain the percentage of cotton in a sample composed of wool and cotton: Boil the cleaned, dried and weighed sample gently for two hours in 80° B. caustic potash, then wash it well and re-dry it. During boiling add from time to time a few drops of water so as to prevent the alkali from becoming too concentrated. After drying at 212° F. the residue is weighed, the result giving the weight of cotton, and the loss, that of wool. Instead of potash, 7° B. caustic soda may be used, boiling in this case being restricted to a quarter of an hour.

To separate wool from cotton: Remove any size or dye by boiling the sample in dilute hydrochloric acid, dilute lye, or by extraction with alcohol, ether, etc., and dried at 212° F., and placed in 4 parts of sulphuric acid and 1 part of water for twelve hours, then mixed with three volumes of absolute alcohol and water and filtered. The residue is washed in absolute alcohol until the washings are colorless, and afterwards with water, being finally dried and weighed to ascertain the weight of wool present.

Another method is thus: After freeing the sample from dye and sizing as before, and washing, the same is dried and weighed, and then immersed in ammoniacal copper oxide for twenty minutes, after which water is added. The residue left after filtration is thoroughly washed, dried and weighed, the result giving the amount of wool in the mixture.

To separate silk, cotton and wool, in a sample containing these three fibres: Remove the size and dye, as previously explained, and in turn treat the sample with ammonical nickel oxide, which dissolves the silk at once. The cotton in turn is then dissolved from the remaining portion of the sample by means of ammoniacal copper oxide, leaving the wool behind.

To ascertain the percentage of each in a sample composed of silk, cotton and wool, two samples of yarn, each weighing two grams, are dried, weighed and boiled for a quarter to half an hour, in 200 c. c. of 30° B. hydrochloric acid to remove the size and dye, and are then thoroughly washed and pressed. One sample is then immersed for a short time in a boiling solution of basic zinc chloride, then washed thoroughly, first in acidified, afterwards in clean water, then dried and weighed, the difference in weight giving the amount of silk. The second sample is then boiled for fifteen minutes in 60 to 80 c. c. of caustic soda (sp. gr. 1.02), and then washed, dried and weighed, the difference in weight representing the proportion of wool. The residue is cotton, the dry weight of which must be augmented by about 5 per cent. to compensate for the corrosion of the fibre during the operation.

To separate silk, tussah silk, wool and cotton in a sample, have the sample first acted on by boiling half a minute with concentrated hydrochloric acid, which immediately dissolves the silk, the tussah silk being dissolved at the end of two minutes' further boiling. On treating the remainder of the sample with hot caustic potash, the wool will then be dissolved, and the cotton left.

To determine the presence of cotton and flax in a sample, the same is dyed by immersion in alcoholic fuchsine solution (1 gram fuchsine in 100 c. c. alcohol), then washed with clean water until the color ceases to run, and steeped in ammonia for about three minutes. The flax fibres or threads will then have been dyed rose color, whereas the cotton fibres or threads will be decolorized.

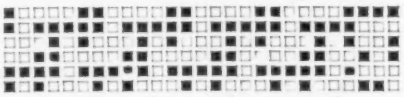
For the purpose of quantitative separation, the sample after having been freed from any size or dye, by a suitable boiling in dilute hydrochloric acid or distilled water, followed

by a thorough rinsing, is then dipped for one and a half or two minutes in concentrated 66° B. sulphuric acid, then rinsed out well, rubbed between the fingers and neutralized by steeping in dilute ammonia or sodium carbonate solution. After washing over again in water the sample is pressed between blotting paper and dried and when flax fibres or threads will, as a rule, be found to have retained their structure, while the cotton fibres or threads have dissolved after passing through a gelatinous stage in which they will tear like tinder.

In February, 1817, there were placed on sale in Philadelphia Dacca muslins made in India "at $200 for as much of them as weighs one pound avoirdupois."

NOVELTIES FROM FOREIGN SOURCES.

Worsted Trousering.



Complete Weave. Repeat 27×6.

Warp:—6900 ends, 66 inches wide in loom, 15 harness fancy draw.

Dress:—

1 end, 2/64's worsted, black, twisted with 80/2's silk, white.. ... . = 1 end.
1 end, 2/30's worsted, black..... = 1 end.
1 end, 2/64's worsted, black ..... = 1 end.
1 end, 2/40's worsted, gray and white twist..... = 1 end.
1 end, 2/30's worsted, gray. ..... = 1 end.
1 end, 2/64's worsted, gray..... = 1 end.
1 end, 2/64's worsted, black..... = 1 end.
1 end, 2/30's worsted black..... = 1 end.
1 end, 2/64's worsted, black..... = 1 end.
1 end, 2/64's worsted, gray ..... = 1 end.
1 end, 2/40's worsted, gray and white twist..... = 1 end.
1 end, 2/64's worsted, black, twisted with 80/2's silk, white..... = 1 end.
1 end, 2/64's worsted, black..... = 1 end.
1 end, 2/30's worsted, black..... = 1 end.
1 end, 2/64's worsted, black..... = 1 end.
1 end, 2/64's worsted, gray..... = 1 end.
1 end, 2/30's worsted, gray ..... = 1 end.
1 end, 2/64's worsted, black, twisted with 80/2's silk, white ..... = 1 end.
1 end, 2/64's worsted, black..... = 1 end.
1 end, 2/30's worsted, black..... = 1 end.
1 end, 2/64's worsted, black..... = 1 end.
1 end, 2/64's worsted, gray..... = 1 end.
1 end, 2/40's worsted, gray and white twist..... = 1 end.
1 end, 2/64's worsted, dark gray, twisted with 80/2's silk, white..... = 1 end.
1 end, 2/64's worsted, black..... = 1 end.
1 end, 2/30's worsted, black..... = 1 end.
1 end, 2/64's worsted, black..... = 1 end.

Repeat of pattern: 27 ends.

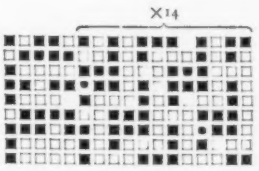
Filling:—95 picks per inch, arranged thus:

2 picks, 2/64's worsted, black.
1 pick, 2/30's worsted, black.

3 picks. Repeat of pattern.

Finish:—Worsted finish, scour well, shear clear, 56 inches wide.

Worsted Trousering.



Complete Weave.

Repeat 173×9.

Warp:—7420 ends, 16 harness fancy draw.

Reed:—19 × { 1×5= 5 / 28×6=168 } =65¾ inches wide in loom.

Dress:—

1 end, 2/56's worsted, black and gray twist..... = 1 end.
4 ends, 2/56's worsted, black..... = 4 ends.
22 ends, 2/56's worsted, black and gray twist..... = 22 ends.
1 end, 2/64's worsted, black and white, twisted with single 64's worsted, black... } ×2= 24 ends.
1 end, 2/56's worsted, black and slate, twist..... }
10 ends, 2/56's worsted, black and gray twist.....
1 end, 2/56's worsted, black, twisted with 200/2 silk, white ..... = 1 end.
1 end, 2/56's worsted, black and slate twist..... = 1 end.
10 ends, 2/56's worsted, black and gray twist..... = 10 ends.
1 end, 2/56's worsted, black, twisted with 200/2 silk, white..... = 1 end.
1 end, 2/56's worsted, black and slate, twist..... = 1 end.
8 ends, 2/56's worsted, black and gray twist.....8 } ×3= 36 ends.
1 end, 2/56's worsted, black, twisted with 200/2 silk, white..... } ×2=4
1 end, 2/56's worsted, black and slate twist }
10 ends, 2/56's worsted, black and gray twist..... }
1 end, 2/56's worsted, black, twisted with 200/2 silk, white..... } ×1= 24 ends.
1 end, 2/56's worsted, black and slate, twist..... }
10 ends, 2/56's worsted, black and gray twist..... }
1 end, 2/64's worsted, black and white, twisted with singles 64's worsted..... } ×2= 24 ends.
1 end, 2/56's worsted, black and slate twist..... }
24 ends, 2/56's worsted, black and gray twist..... = 24 ends.

Repeat of pattern: 173 ends.

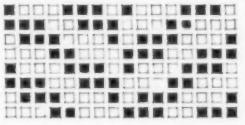
Filling:—80 picks per inch, arranged thus:

2 picks, 2/56's worsted, black.
1 pick, 3¾ run woolen backing, black.

3 picks. Repeat of pattern.

Finish:—Worsted finish, scour well, shear clear, 56 inches wide.

Worsted Cheviot Suiting.



Complete Weave.

Repeat 16×4.

Warp:—2635 ends, 8 harness fancy draw.

Reed:—19×2=69 inches wide in loom.

Dress:—

1 end, 2/36's worsted, dark brown twisted over with 2/60's white mercerized cotton= 1 }
2 ends, 2/14's worsted cheviot, light brown } ×3=12 } ×4= 64 ends.
2 ends, 2/16's worsted cheviot, dark brown }
2 ends, 2/14's worsted cheviot, light brown.....= 2 }
1 end, 2/16's worsted cheviot, dark brown.....= 1 }
1 end, 2/36's worsted cheviot, dark brown twisted over with 2/60's white mercerized cotton ..... = 1 end.
2 ends, 2/14's worsted cheviot, light brown..... = 2 ends.
1 end, 2/16's worsted, dark brown..... = 1 end.
1 end, 2/32's worsted, white and blue twisted over with single 32's worsted, dark brown... . = 1 end.
2 ends, 2/14's worsted cheviot, light brown..... . ....= 2 ends.
2 ends, 2/16's worsted cheviot, dark brown..... = 2 ends.
2 ends, 2/14's worsted cheviot, light brown..... .....= 2 ends.

1 end, 2/16's worsted cheviot, dark brown = 1 end.
1 end, 2/32's worsted cheviot, white and blue twisted over with single 32's worsted, dark brown = 1 end.
2 ends, 2/14's worsted cheviot, light brown = 2 ends.
1 end, 2/16's worsted cheviot, dark brown = 1 end.
1 end, 2/30's worsted cheviot, dark brown twisted over with 2/60's white mercerized cotton = 1 end.
2 ends, 2/14's worsted cheviot, light brown = 2 ends.
1 end, 2/16's worsted cheviot, dark brown = 1 end.
1 end, 2/52's worsted, black and red, two fold = 1 end.
2 ends, 2/14's worsted, light brown = 2 ends.
2 ends, 2/16's worsted cheviot, dark brown = 2 ends.
2 ends, 2/14's worsted, light brown = 2 ends.
1 end, 2/16's worsted cheviot, dark brown = 1 end.
1 end, 2/52's worsted, black and red, two fold = 1 end.
2 ends, 2/14's worsted, light brown = 2 ends.
1 end, 2/16's worsted cheviot, dark brown = 1 end.

Repeat of pattern: 96 ends.

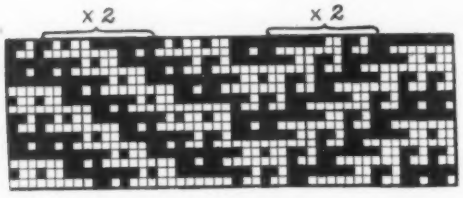
Filling:—35 picks per inch, arranged thus:

1 pick, 2/36's worsted, dark brown, twisted with 2/60's white, mercerized cotton.
15 picks, 2/16's worsted cheviot, dark brown.
} ×4 = 64 picks.
1 pick, 2/36's worsted, dark brown, twisted over with 2/60's white, mercerized, cotton. = 1 pick.
4 picks, 2/16's worsted cheviot, dark brown. = 4 picks.
1 pick, 2/52's worsted, black and red, 2 fold. = 1 pick.
5 picks, 2/16's worsted cheviot, dark brown. = 5 picks.
1 pick, 2/52's worsted, black and red, 2 fold. = 1 pick.
4 picks, 2/16's worsted cheviot, dark brown. = 4 picks.
1 pick, 2/36's worsted, dark brown, twisted over with 2/60's white, mercerized cotton. = 1 pick.
4 picks, 2/16's worsted cheviot, dark brown. = 4 picks.
1 pick, 2/32's worsted white and blue, twisted over with single 32's worsted, dark brown = 1 pick.
5 picks, 2/16's worsted cheviot, dark brown. = 5 picks.
1 pick, 2/32's worsted, white and blue, twisted over with single 32's worsted, dark brown = 1 pick.
4 picks, 2/16's worsted cheviot, dark brown. = 4 picks.

Repeat of pattern: 96 picks.

Finish:—Worsted cheviot finish, 56 inches wide.

Worsted Trousering (Silk Stripe).



Complete Weave. Repeat 72×8.

Warp:—10,200 ends, 66½ inches wide in loom, 24 harness fancy draw.

Dress:—

1 end, 2/60's worsted, slate, twisted with 2/80's mercerized cotton, white
1 end, 2/60's worsted, dark slate
1 end, 2/60's worsted slate, twisted with 2/80's mercerized cotton, white
} ×2 = 6 ends.
1 end, 2/60's worsted, black
1 end, 2/60's worsted, dark slate.
1 end, 2/60's worsted, black
} ×2 = 6 ends.
1 end, 2/60's worsted, slate, twisted with 2/80's mercerized cotton, white = 1 end.
1 end, 2/60's worsted, dark slate = 1 end.
1 end, 2/60's worsted, slate, twisted with 2/80's mercerized cotton, white = 1 end.
1 end, 2/60's worsted, black
1 end, 2/60's worsted, dark slate.
1 end, 2/60's worsted, black
} ×3 = 9 ends.
1 end, 2/60's worsted, slate, twisted with 2/80's mercerized cotton, white.
1 end, 2/60's worsted, dark slate
1 end, 2/60's worsted, slate, twisted with 2/80's mercerized cotton, white.
} ×2 = 6 ends.
1 end, 2/60's worsted, black.
1 end, 2/60's worsted, dark slate.
1 end, 2/60's worsted, black.
} ×4 = 12 ends.
1 end, 2/60's worsted, slate, twisted with 2/80's mercerized cotton, white.
1 end, 2/60's worsted, dark slate
1 end, 2/60's worsted, slate, twisted with 2/80's mercerized cotton, white
} ×2 = 6 ends.
1 end, 2/60's worsted, black
1 end, 2/60's worsted, dark slate.
1 end, 2/60's worsted, black
} ×3 = 9 ends.
1 end, 2/60's worsted, slate, twisted with 2/80's mercerized cotton white. = 1 end.
1 end, 2/60's worsted, dark slate = 1 end.
1 end, 2/60's worsted, slate, twisted with 2/80's mercerized cotton, white = 1 end.
1 end, 2/60's worsted, black
1 end, 2/60's worsted, dark slate
1 end, 2/60's worsted, black
} ×2 = 6 ends.
1 end, 2/60's worsted, slate, twisted with 2/80's mercerized cotton, white.
1 end, 2/60's worsted, dark slate
1 end, 2/60's worsted, slate, twisted with 2/80's mercerized cotton, white
} ×2 = 6 ends.

Repeat of pattern: 72 ends.

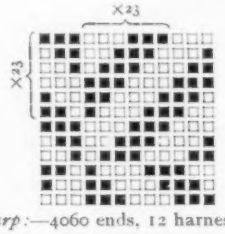
Filling:—110 picks per inch, arranged thus:

1 pick, 2/60's worsted, black.
1 pick, 5½ run woolen, yarn.

2 picks. Repeat of pattern.

Finish:—Worsted finish, scour well, shear clear, 56 inches wide.

Worsted Suiting.



Complete Weave.

Repeat 144×144.

Warp:—4060 ends, 12 harness fancy draw.

Reed:—21×3=64½ inches wide.

Dress:—

1 end, 2/26's worsted, black. = 1
1 end, 2/36's worsted, dark slate, twisted over with 2/80's mercerized cotton, white. = 1
2 ends, 2/26's worsted, black. = 2
1 end, 2/26's worsted, dark gray = 1
1 end, 2/26's worsted, black. = 1
} ×2 = 12
1 end, 2/26's worsted, black. = 1
1 end, 2/36's worsted, dark slate, twisted over with 2/80's mercerized cotton, white = 1
2 ends, 2/26's worsted, black. = 2
2 ends, 2/26's worsted, black. = 2
} ×7 = 126 ends.
1 end, 2/26's worsted, black. = 1 end.
1 end, 2/36's worsted, dark slate twisted over with 2/80's mercerized cotton, white. = 1 end.
2 ends, 2/26's worsted, black. = 2 ends.
1 end, 2/26's worsted, dark gray. = 1 end.
1 end, 2/26's worsted, black. = 1 end.
1 end, 2/26's worsted, black. = 1 end.
1 end, 2/36's worsted, dark slate twisted over with 2/80's mercerized cotton, white. = 1 end.
2 ends, 2/26's worsted, black. = 2 ends.
1 end, 2/26's worsted, dark gray. = 1 end.
1 end, 2/26's worsted, black. = 1 end.
1 end, 2/26's worsted, black. = 1 end.
1 end, 2/36's worsted, dark slate twisted over with 2/80's mercerized cotton, white. = 1 end.
1 end, 2/26's worsted, black. = 1 end.

Repeat of pattern: 144 ends.

Filling:—62 picks per inch, arranged thus:

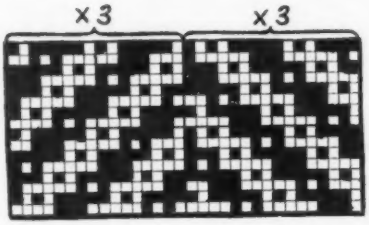
1 pick, 2/52's worsted, black and red, twisted over with single 36's worsted, black. = 1 pick.
1 pick, 2/52's worsted, black and blue, twisted over with single 36's worsted, black. = 1 pick.
1 pick, 2/52's worsted, black and red, twisted over with single 36's worsted, black. = 1 pick.

1 pick, 2/26's worsted, black
1 pick, 2/26's worsted, dark gray
1 pick, 2/26's worsted, black } ×5=15
3 picks, 2/26's worsted, black = 3
1 pick, 2/26's worsted, black
1 pick, 2/26's worsted, dark gray
1 pick, 2/26's worsted, black } ×5= 15 picks.
×7= 126 picks.

Repeat of pattern: 144 picks.

Finish :—Worsted suiting, scour well, shear clear, 56 inches wide.

Worsted Melton Suiting.



Complete Weave. Repeat 96×16.

Warp :—6820 ends, 16 harness fancy draw.

Reed :—16½×6=69 inches wide in loom.

Dress :—

4 ends, 2/48's worsted, black and gray, twist
4 ends, 2/48's worsted, black } ×2 = 16 ends.
8 ends, 2/48's worsted, black = 8 ends.

Repeat of pattern: 24 ends.

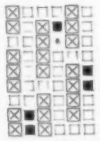
Filling :—120 picks per inch, arranged thus:

4 picks, 2/48's worsted, black and gray twist,
4 picks, 2/48's worsted, black } ×2 = 16 picks.
16 picks, 2/48's worsted, black = 16 picks.

Repeat of pattern: 32 picks.

Finish :—Worsted melton finish, scour well, shear, 56 inches wide.

Worsted Trouserings.



Complete Weave.

Repeat 6×9.

Warp :—7680 ends, 12 or 18 harness straight draw.

Reed :—20×6=64 inches wide in loom.

Dress :—

6 ends, 2/64's worsted, black = 6 ends.
2 ends, 2/64's worsted, dove gray
1 end, 2/64's worsted, dark slate, twisted with 200/2 silk, white
1 end, 2/64's worsted, slate and white twist
2 ends, 2/64's worsted, black
2 ends, 2/64's worsted, dove gray
2 ends, 2/64's worsted, black
1 end, 2/64's worsted, dark slate, twisted with 200/2 silk, white
1 end, 2/64's worsted, slate and white twist
2 ends, 2/64's worsted, black
×4= 24 ends.
×5= 40 ends.
2 ends, 2/64's worsted, dove gray = 2 ends.
2 ends, 2/64's worsted, black = 2 ends.
1 end, 2/64's worsted, dark slate, twisted with 200/2 silk, white = 1 end.
1 end, 2/64's worsted, slate and white twist = 1 end.

Repeat of pattern: 76 ends.

Filling :—85 picks per inch, arranged thus:

1 pick, 2/64's worsted, black.
1 pick, 3 run woolen yarn.
1 pick, 2/64's worsted, black.

3 picks. Repeat of pattern.

Finish :—Worsted finish, scour well, shear clear, 56 inches wide.

FULLING AND THE MACHINERY FOR THE PROCESS.

The purpose of fulling is to obtain the shrinkage required for the proper length, width and weight of the fabric, at the same time putting the structure in such a condition as to permit the following finishing processes to be properly performed. It adds strength to the fabric; loosens any superfluous dyestuff matter adhering to the fibres, as well as all oil, grease, etc., added to the wool to permit carding and spinning, size added to the warp yarn for proper weaving, etc. This loss in weight of the fabric, as well as any further loss to the cloth during scouring, gigging, napping, shearing or any other finishing process, must be carefully taken into consideration by the finisher, with reference to shrinking length of fabric, in order to obtain proper final weight of cloth required.

Previous to fulling prepare the piece by sewing the selvages together with the face on the inside, keeping them thus by tacking or sewing together, either by hand or a sewing machine. Even when the goods are not flocked, it is much better to tack them, as they will full more even. The sides then are are the same thickness as the middle, thereby receiving the same pressure. The soaps cannot strike on the face more quickly in one place than in another. The face will not chafe or rub against the rolls or sides of the mills, and if the fabric be soaped properly, there should be no trouble in regard to stains or spots where color is gone, or uneven felting, so far as this part is concerned.

Fulling is based upon the felting properties of the wool fibres. The felting capacity of the wool fibre is, during fulling, called into action by bringing an alternating pressure to bear upon the moist fabric, i. e., wool fibres, in connection with a certain amount of heat. This alternating pressure is produced

in the fulling mill by means of a set of rolls, between which the cloth is made to pass. These rolls vary in size in the various makes of fulling mills, however about 8 inches face by 18 inches diameter is a fair average of their dimensions. The face of the rolls is generally of wood or hard rubber, while the rest is of iron, very few all iron rolls being used. In most makes of fulling mills smooth face rolls are used, however in some makes the lower one of these rolls is supplied with flanges and the upper roll made to run inside of them, again in some foreign makes of machines, the shape of these rolls is changed. As the weight of the top roll is insufficient to exert sufficient pressure upon the cloth under operation, elliptic springs are used to increase this pressure. The aim of the fuller should be to put as much cloth as possible between these rolls, since this will act as a cushion, and the pressure will thus be more effective. To keep the cloth running in the proper position in the mill, guide rolls and a guide frame are placed in the mill, the latter in some instances being made to act as a stop motion, provided the run of the cloth gets, for one reason or the other, snarled up at the bottom of the mill, and thus causes a knot to form, which on account of being too large to pass through its guide ring in the frame, will lift the whole frame and thus cause an outside arm, through proper lever connections to stop the machine, in turn preventing the cloth from being worn tender in places, or causing holes to be made, as would be the case if the run of the cloth was arrested, and the rolls keeping on turning, and consequently acting continually on one place of the fabric.

The pressure thus exerted by the rolls upon the fabric is, however, only in one direction, and which is laterally, for which reason the fabric if only exposed to this pressure, would shrink only widthways, the strain put upon the fabric while being pulled along by the rolls, through guide rings and from the bottom of the mill, having a tendency to rather stretch the fabric lengthways than shrink it. Thus means had to be provided in the construction of the fulling mill to counteract this tendency, and simultaneously exert sufficient pressure to cause the fabric to also shrink in its length when so required, and which is accomplished by providing a device known as the trap or clapper to the mill. This contrivance is placed directly back of the rolls, and in such a position that the fabric will have to pass through this box-like affair before allowed to drop to the bottom of the mill. These boxes vary in length in the different makes of fulling mills, however, they should not be allowed to fall below 18 inches in length. The top of the trap is firmly fastened to a shaft, which extends to the outside of the fulling mill, and is also supplied with an arm, which is fastened so as to stand in the same direction as the top of the box, which is fastened to the other end of this shaft. This cover is made to fit inside of the box, being of a shape to permit its easy working up or down. To the end of the outside arm is fixed a rod, which hangs down, being arranged to allow weights to be attached to it. The pressure required to lift the top of the box must thus be strong enough to also lift this arm with whatever weights are attached to it, and by this means the pressure is brought to bear upon the fabric. At the same time, by means of changing the weights, the pressure required is regulated. The goods, after being pushed into the box by the rolls, accumulate until the pressure is sufficient to raise the top of the box, and thus allow the goods to drop again to the bottom of the mill, the goods being thus shrunk in length according to requirements.

Again there is another class of goods, which instead of shrinking in length, are required to stretch a certain amount, making them come from the fulling mill rather longer than when they entered it, flocks in many instances being relied upon to bring them up to a required weight.

Different pieces ought to be sorted, because every different structure of cloth will full differently, and if two pieces of a different construction are put into the mill together, one will come up quicker than the other, leaving one running alone, causing it to full slower, run longer, and in turn become weaker than if run with one of the same style.

The fulling mill must be kept in good condition, and the roller must be true and in no way worn in the centre, because slip will take place, and it is a prime object in the operation to get all the friction possible to make the goods full evenly; the stretch roller and guides must be set so that the cloth will run steadily in the centre of the rollers; the springs on the rollers should be correctly balanced to prevent one end of the roller having more pressure on the cloth than the other. This, though apparently of little or no consideration, is a source of uneven felting, and, in the finish, one portion will feel and look clothy, and the other will be sleazy and raw.

The moisture required for felting is added to the fabric in connection with a good soap, which in turn also exerts a softening influence upon the fibre, besides being useful in removing the emulsion which has been given to the wool stock in the picking room in order to be able to card the wool and spin the roving into yarn. Again it will keep the goods from chafing and wearing off too much during the fulling process. The requirement for a good fulling soap is a hard soap, which is free from caustic, i. e., is neutral, for the caustic, if present to any extent in the hard soap, is sure to injure the colors more or less, if not the fibre, and once the color has been injured, it is impossible to remedy the injury. The strength of this soap for fulling purposes depends upon the fabric handled; the same, however, must possess sufficient body to turn out the grease from the fabric, and hold it in such a state that, to all appearance, it might be scraped off the cloth any time, to the end of the process. If the soap is not heavy or has not sufficient alkali to start the grease, dirt, etc., in the cloth, cloudiness and dullness of colors are sure to result. For fabrics with extra bright colors, and which naturally have been more carefully handled from the fibre to the woven cloth (cleaner all around), use a good neutral soap liquor, lukewarm, pour slowly on the fabric, not too much at a time, the weight of the goods determining this point, using about one pound hard neutral soap to a gallon of water, and about 9 gallons of this prepared soap liquor to about 45 pounds of goods. In solid colors, as mentioned before, a very small quantity of alkali might be used, if any difficulty found in forcing out the grease, dirt, etc. Some claim that alkali assists fulling, but the proper way is by means of it only to help to loosen the grease and dirt, the fulling not to commence until the grease and dirt in the fabric become loose. One pound of good soap used in this manner will do more towards getting the goods clean than double or more the amount used later on in the washing machine, by preventing the dirt from being first felted into the cloth structure, making it hard to get rid of in washing afterwards. Thin alkali soaps, if used, will run the dirty grease and dyestuffs through and through the fabric, staining the structure and causing the colors to become dead. There will be found a vast difference in the finished fabric between starting the fulling in a greasy condition or when this grease has been loosened, this being the reason why very delicate fabrics are first washed before being brought to the fulling mill. Heavy goods and fabrics constructed with an extra high, heavy texture, and such as carry in their body a considerable amount of grease and dirt, will frequently be found to full with difficulty, for which reason it is well also to wash such fabrics previous to fulling. This washing does not necessarily have to be as thorough as that which succeeds the fulling; however, it has to be sufficiently vigorous to loosen up the foreign materials in the fabric, and give the fibres an opportunity to come in contact with the soap during fulling, and thus to get all the benefit which is to be derived from moisture, heat and friction.

It might be thought that washing the goods before fulling would make the latter operation, so far as time is concerned, shorter, but this is not so; however, the distinct advantage comes in the appearance of the finished goods, together with their handle or feel, and brighter colors obtained, all of which should repay the extra expense of a first washing of such fabrics. This previous washing will also aid when dealing with fabrics in the construction of which low grades of carbonized wools have been employed, and when there is a considerable difference in the amount of time required for fulling these

goods when they are washed previously, and when they are not. If they have been thoroughly washed for three or four hours with a good supply of soda alkali, previous to fulling, the time will be reduced nearly one-third. Again if shoddy is extensively used, as it generally is in these low grade woolens, then the washing before fulling will in many instances give the fabric the appearance of all wool cloth, pretty nearly covering the adulterant. However, the shoddy in this instance has got to be in the right condition. That is, if it is carbonized, as it usually is, it must be washed free of sulphuric acid, since where this free acid is present, and the goods are brought in contact with a soda alkali, the tendency is for the formation of a combination upon the surface of the fibres, which will act injuriously in connection with the fulling, since it is insoluble in water unless the water is considerably heated.

(To be continued.)

FLOCKING AND FLOCK CUTTING MACHINERY.

Flocks, if carefully handled, need not be a detriment to the fabric, although flocked goods are always treated more or less with suspicion by the commission merchant and clothier, as well as the consumer, possibly for the fact that flocks and the process of flocking the goods do not receive the care they should.

One of the disadvantages of flocked goods frequently met with, is the tendency of the flocks to drop out of the fabric and gather in the lining of the garment, and for which reason such garments as are lined, as coats, for example, have their lining loose at the bottom, so that whatever flocks drop out of the fabric during wear, they will drop out of the garment and not get a chance to lodge in the bottom seams of the lining. However, when flocks are thus coming excessively out of the fabric or garment (some certainly will always more or less come out), it is a sure sign of an error somewhere, it may be poor flocks, a wrong way of flocking, too many flocks used consistent with the structure of the fabric under operation, etc.

With reference to poor, i. e., low, cheap grades of flocks, one point is sure, and that is that these cheap grades of flocks are the most expensive in the end, since there is more waste in the first place, and besides an excessive amount of these low grades of flocks has to be put on the goods to bring them anywhere near the weight wanted. Thus being compelled to use an excessive amount of flocks in order to bring up the fabric under operation to its required weight, will in turn certainly be the cause of flocks getting on the face of the goods, no matter how good they are tacked, and this, of course, lessens the attractiveness of the face of the goods. Flocks certainly are an adulterant to woolen fabrics. They are added with a view to get, in proportion, for this inferior article, the full value of the fabric, and as with all such adulterants, if used, only the best should be used.

However, another important feature to be taken into consideration, besides the grade or quality of flocks at hand, is the structure of the fabric as to be flocked, for the fact that goods containing a considerable amount of shoddy, mungo, extract, waste of cotton, flocks will not felt as readily to such structures as to a fabric made of a good wool stock, and where the wool fibres (may they be what we term wool or shoddy) have plenty of felting power. Some authorities quote: Use good flocks with already adulterated structures and poor flocks with pure wool structures. This may be all right provided a poor lot of flocks, by carelessness of the buyer is in the mill, but to buy a poor grade of flocks for the sake of trying to save money to the mill, is a poor policy, the difference in price being too small an item and certainly is lost, and more too. At the same time let us mention that even with good grades of flocks in a mill, only the best can be used with lower grades of fabrics, for example, cotton warp goods, termed more generally union cassimeres, and where the warp is mostly all cotton—with a fancy woolen thread possibly now and then introduced for a fancy effect—and the filling a mixture of a few per cent. of wool, and any amount of per cent. of shoddy waste, mungo or cotton. To try to stick a poor grade of flocks on such a structure can only result in

failure, for in most cases a considerable amount of the flocks will sift out of the goods before they leave the mill, to say nothing of what happens afterwards during the manufacture of clothing, and the wearing of the garment; there is nothing to retain the flocks, they have nothing in them to make them adhere to the structure on which they are simply pasted, and stay on while wet, but the moment the goods are dry, they drop off; whereas a flock which has felting qualities will be more apt to become part of the fabric, having more or less sufficient power within itself to do so.

This naturally leads us to the question of how to distinguish good flocks from poor flocks. In answer we must admit that it is a hard matter to determine the value of a lot of flocks until the same is tried, for even if the flocks have been made of good stock, the chances are that they have been spoiled at the process of cutting, and for which reason, flock cutting machinery must be kept in good condition, for anything which will tend to grind instead of cutting the stock, i. e., the fibres, will simultaneously destroy the felting properties of the flocks thus produced, the best of stock in this manner being frequently made practically worthless.

Thus we see that the first and most important element in successful flocking is (1) the quality of the stock, and (2) the proper cutting of the same.

This feature of a scientific cutting of the stock into flocks is readily seen by the value of what is known as shear flocks. These flocks are the clippings of the protruding ends of the nap obtained in shearing face finished goods or of protruding fibres of the threads in connection with threadbare finished fabrics; and since such flocks are cut most carefully at the process of shearing, they naturally retain all the felting capacity of the fibres.

The stock to be cut is of two kinds: (1) Rags, which have to be first cut into small shreds on a rag cutter, previous to being submitted to the flock cutter; (2) Mill waste of every description, like gig flocks, sweepings, etc., which do not require handling by a rag cutter; however no matter what stock to be used, it must be first well cleansed of all such things like nails, pieces of metal, or any other hard substance, etc., before cutting, since otherwise the blades of the flock cutter would get ruined. This cleaning of flock stock is done by means of running the latter through a flock renovator, and where the stock is not only opened and put in the best condition for cutting, but all foreign, heavy substances, as previously referred to, will fall to the bottom of the machine and not go through with the stock, and in turn spoil the blades of the flock cutter. This machine can also be used for blending and mixing several grades of stock, mixing up shades, as well as for thoroughly opening and dusting flocks which have become caked together in the bale from dampness, long standing, or any other cause.

The rag cutter has for its purpose to cut rag stock into flocks, having plates about fifteen inches long in both the cylinder and the bed. These plates are plated with steel on both edges, so that the cylinder may be run first in one direction and then in the other, the reversal of the motion of the cylinder rendering all the blades, in both cylinder and bed, self sharpening. When one edge of the blades gets dull, the feed apron is taken off and put on the other side of the machine, and the cylinder is then run in the opposite direction. The machine cuts the stock up into narrow strips or pieces about three-eighths of an inch wide, leaving it in good condition for feeding into the flock cutter, and has a capacity of 2000 to 3000 lbs. a day, according to the kind of stock. The usual speed of the machine is from 250 to 300 revolutions a minute.

The object of the flock renovator has been previously referred to. The stock is fed from a hopper into the small end of the cone of the machine, and after being opened is blown out by the fan through the outlet at the large end; the machine being usually arranged to blow the stock into a small room partitioned off for the purpose. The usual speed of the machine is from 800 to 1000 revolutions a minute.

The flock cutter is the machine for transforming the flock stock as coming from either the rag cutter or flock renovator, into the product known as flocks. The special

features of the machine consist in means for making the cylinder reversible and the blades self sharpening; in the arrangement for feeding in the stock, and vibrating the cylinder; and in the mode of holding and adjusting the blades in the bed. The vibrating attachment has for its object to prevent the cylinder from running in one place and wearing a groove.

In flock cutters where the cutting cylinder is made to revolve continually in one direction, the cutting edge of the blades soon becomes dull, and simply grinds or mashes the flocks; the only remedy in such cases is to grind or sharpen the blades, which, of course, consumes much time and involves considerable expense and trouble. This frequent grinding is done away with, in the style of a flock cutter first referred to, by means of the peculiar construction of the blades, the reversible feeding device and arrangement of the discharge orifices, which in turn render the blades self sharpening. There are sixteen blades, twenty-eight inches long, in the cylinder, and nine blades in the bed. The central portion of the blades is iron, covered on each side with a plate of steel, welded onto the iron and hardened, so that the central portion will readily wear away and leave a steel cutting edge on each side. As the machine is used in cutting flocks, the natural consequence is that each of the blades is dulled at one edge and sharpened at the other. By means of the driving belts, the cylinder is made to revolve in either direction at will, allowing the sharp edge of the blades to be always used for cutting the stock, and as the motion of the cylinder is reversed, the flocks are carried in either direction and discharged at either end of the machine, while at the same time all the blades in both cylinder and bed are rendered self sharpening. As the blades in the bed wear away, they may be adjusted from time to time, either separately or collectively, as may be required. The machine has a capacity of 600 to 1200 lbs. a day, according to the kind of stock to be cut, whether rag stock or mill waste—hard or soft stock.

How long the cylinder will run before it needs reversing depends upon the kind of stock that is cut. On soft stock it will run several days, while on hard rags it will need reversing every day; frequent reversing of the cylinder is desirable, as it will prevent the blades from getting very dull on one edge. The usual way of reversing the cylinder is to have two belts, one an open and the other a cross belt, changing the belts when it is desired to reverse the cylinder. Every time the belt is changed, the feeding box will have to be changed also to the other end of the machine. By this frequent changing the cutting of the machine is kept in good condition all the time, and does away with frequent grinding.

As the cylinder blades wear away, plane off the tops of the wooden lags between the blades so as to keep them about three-sixteenths of an inch below the cutting edge of the blades; when the blades are worn down considerably, take the wooden strips out entirely.

When the bed blades get worn down to within one-eighth of an inch of the iron lags it is necessary to raise them, and to set them when they are raised, using the setting bar which comes with the machine for this purpose. Bring the blades up to the cylinder as you would in cutting stock, then take out the cylinder, lay the setting bar with the collars on it, which should be the same size as the bearings, into the boxes, and set the pointer to the bed blades; this gives the exact diameter of the cylinder. Then drop the bed sufficiently to allow the blades to be raised; loosen the four set screws protruding obliquely at the side of the frame and raise all the blades by turning up the raising screws in the bottom of the bed till they touch the pointer on the setting bar; then put the cylinder back in its place, and grind the blades together with oil and emery, using about No. 70 emery. To grind the blades together with oil and emery, turn the cover of the machine over back and clean all the flocks from the cylinder and bed. Run the cylinder in either direction and apply oil and emery to the blades, the usual way being to have the oil and emery mixed together in a dish in the form of a thin paste, and apply with a leather swab or pad made similar to a carder's strickle. Bring the bed blades close up to the

cylinder and grind with the oil and emery until you have the blades of the cylinder and bed ground to a sharp edge. Be sure to vibrate the cylinder all the time it is grinding. After grinding clean all the oil and emery from the machine before using. By drawing up on the four set screws, previously referred to, the knives are pressed together and are firmly held in position, even though the lower screws, by means of which they are placed in position, become loosened or even drop out altogether as often happens.

In all ordinary use the cylinder will seldom need grinding, as the blades will be sharpened by reversing the motion of the cylinder. Should the blades get roughened or out of true at any time, it is well to grind them together, as is done when the bed blades are raised. When a new set of bed blades is put into the machine the blades should be set to fit the circle of the cylinder and then ground together with oil and emery in the same way as described before. As soon as feeding on the stock commences, it will at once be seen whether the grinding is done well or not. If the machine takes the stock without effort on the part of the operator, then the work is done all right, but if the stock has to be pushed into the machine, it is a sign that the knives are not yet sharp enough. If the flocks leave the machine good and even and without nubs, everything is all right, but if it is all nubs and rolled up, and feels more like sawdust than flocks, then the knives should be drawn up a trifle and the effect noted. As soon as the product comes even and smooth, proceed to cut away and the machine will then do good work with frequent reversings, until the knives become worn down again. As it will not do to have the raising screws in the bottom of the bed fit tightly, on account of their liability to rust in, it is well to weave a string or lace leather around them from one to the other to prevent their jarring loose when the machine is running. Keep the bearings, worm gear and worm well oiled, and the boxes tight. On machines built within the last few years, there is an oiling device on the hub of the loose pulley, and in addition to oiling this pulley through the oil holes, take out the thumb screw and fill the recess with oil, which will work out through the wooden spline beveled into the hub; this aids very much in preventing its getting dry and wearing out the pulley. In feeding in from the hopper—which is set on top of the machine—the stock fed, except if run first through a flock renovator, should be carefully examined, that no pieces of iron or other hard substances are fed into the cutter, otherwise the blades (by reason of there being two sets of blades working one against the other) will be broken. Even if the trouble should not be as serious as that, one point is sure, the work turned out by the machine after a piece of iron has found its way into it will be inferior to that turned out before. The stock to be cut must be fed into the cutter as continuously as possible, so as to prevent the blades running without stock, since this would dull them quicker than cutting will any time.

Do not cut the flocks, for the reason that such a flock will not felt as well as a longer one, on account of possessing too little surface for the felting, and while such flocks apparently go on the goods more readily, they also leave or drop out just as quickly. A very fine flock is also a sign that the machine has been set too tight, in turn rather grinding the stock than cutting it.

With reference to the procedure of flocking the goods, there are several methods in use, all of which have their advantages and disadvantages, which to use depending considerably upon how much weight has to be made up by flocking, how long the pieces will require fulling, as well as the grade and condition of the flocks to be used.

DRY FLOCKING

is frequently used, for the reason that in this manner it is easier to distribute flocks evenly all over the fabric than by wet flocking, although this method may give satisfactory results in connection with lower grades of kerseys, meltons, beavers and similar fabrics, the same cannot be used in connection with better grades of these fabrics, neither on fancy cassimeres, for the reason that too much of the flocks will work through the fabric, and thus get on its face, with the result

that the colors and the face of the goods will have a dull, muddy appearance. When flocking dry, the amount of flocks required to be used is put on the goods immediately after starting the fulling mill, and after they are well distributed over the goods, then soap is applied.

WET FLOCKING.

The best way to do this is to take about one quarter the amount of flocks calculated to be used, and sprinkle them lightly on the goods when they begin to get warm in the fulling mill. Then after awhile, add another quarter of the flocks, and continue in this manner until all the flocks have been added. The flocks put on in this manner will adhere as good as possible to the fabric thus flocked and fulled, since the flocks are thus fed to the fabric when it is in a condition to absorb them best, i. e., when the fabric becomes heated, and thus felting starts.

HALF DRY AND HALF WET FLOCKING

is used when a rather excessive amount of flocks has to be added to a fabric, and in which instance it would take too long to apply the flocks by means of wet flocking, for the reason that the goods would have fulled up in width and length before all the flocks were applied. For this reason part of the flocks are given to the fabric in its dry state and the rest after the goods are wet and become warm.

PRACTICAL POINTS.

Where goods have to be heavily flocked it is a good idea not to remove all the waste of the previous set of pieces, so that this waste may help fill up the corners and crevices of the fulling mills. This will effect quite a considerable saving of the new flocks.

As a rule, for flocking, a good plan is to try a piece, give it so many ounces to the yard—perhaps part dry and the rest of them after they have been wet down—and run for an hour. If you get it right, make a rule by this trial. For example: The piece weighs 24 ounces from loom, with 29 ounces for a standard for finished weight required. Find the difference between the two, which is 5 ounces, multiply the number of yards in the piece by 5 ounces, and divide by 16 ounces; this will give the number of pounds to be added to the piece, plus its loss during finishing. If the next piece weighs only 23 ounces, then, of course, we need more flocks, but by finding the difference each time, especially when there is much variation in the weight or yards, a system is readily formed by which each gets a proportionate amount each time, and at the same time the fuller must adapt his method to the goods, the machinery and the flocks he may have to use, and be governed accordingly.

An example of flocking a light weight fabric which fulled hard: Cotton weave, weight from loom, 7 ounces per yard; finished weight wanted, from 7 to 7 1/2 ounces per yard. If flocked dry, the fabrics in question would have fulled all day, consequently they were let to run up until within two inches of being up to the required width. Then put on the flocks, about 6 ounces to the yard, and finished them in the mill in four hours, and this up to weight wanted. This procedure certainly resulted in more or less waste flocks from the mills, but these were dried and ground over and reused. It took nearly twice as many this way as it would have done had they been flocked dry, and a third more than if flocks had been put to them the first thing after wetting down with the soap.

An example of a light weight Scotch cheviot; Weight from loom, 10 ounces; weave, 4 harness twill; finish weight wanted, 13 ounces. These were flocked just as soon as they were soaped, using about 10 ounces to the yard. They fulled 3 1/2 hours, and came out full enough.

An example of a union cassimere, heavy weight: Weight from loom, 23 ounces; finished weight wanted, 26 1/2 ounces. Proceeded thus: Put on 12 ounces per yard dry, run them for an hour after wetting down, and put on 4 ounces per yard more flocks. Then, an hour later, put on again 4 ounces flocks per yard. The only guide on the goods to ascertain if up to weight is by the feeling, consequently if considered that they were not heavy enough, after putting on 20 ounces to the yard, more flocks should be added until arriving at the point where judgment and practice advised O. K.

CORRESPONDENCE AND NOTES

Upon Textile Topics at Home and Abroad.

THE INFLUENCE OF TWIST ON THE CLOTH.

BY A. CRABTREE, in Textile Manufacturer.

The influence of twist on the appearance of a fabric woven with the simple 2 by 2 twill weave having been dealt with, other and more complex weaves will now be considered with a view to showing whether the same principles will apply, and if so, to what extent and with what reservations. There can be but little doubt that these principles will apply almost, if not quite, in their entirety to all equal-sided twills—i. e., in which warp and weft appear equally on the face. The only feature in such weaves which will cause any marked difference in the influence of the twist is the length of the float. Any increase or decrease in the length of the float will to some extent alter the character of the line of reflection from the threads, as illustrated in Fig. 7.

Threads are there shown bent round a series of rods in such a way as to form floats of different lengths, A floating over one rod, B over two, and C over four. These threads are supposed to be illuminated from a point directly behind the observer, as in the previous examples. It will be seen that the general direction of the line of reflection is diagonally across the thread from corner to corner, no matter what may be the length of float. This is due to the fact that in the longer floats the curve of the thread is less pronounced. As a matter of fact, in the longer floats the middle portion is practically straight, the ends only being curved. This is very noticeable in the thread marked C, where it will be seen that the line of reflection is straight in the middle and deflected at each end of the float. It is evident from these examples that the diagonal direction of the line of reflection is less marked in the longer floats than in the shorter ones, and for this reason it may be confidently stated that the influence of twist on the prominence of a twill will be less marked as the floats on the face of the cloth are increased in length, and vice versa. It may therefore be taken as a general rule that the influence of twist is of the same character in all equal sided twills, but that the influence becomes less marked as the floats are increased in length. This is illustrated in Figs. 8 and 9, which represent fabrics woven with a 3-by-3 twill weave. The

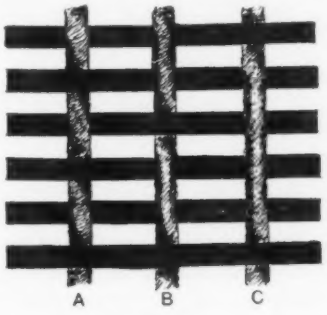


FIG. 7.

two are supposed to be woven from exactly the same yarns, the warp being spun twist-way, and the weft weft-way. In Fig. 8 the twill is run to the left, and in Fig. 9 to the right. The result of the combination of the lines of reflection in these cloths is that the twill to the left (Fig. 8) is more prominent than the one to the right (Fig. 9). The difference between the two is, however, less marked than in the case of the 2-by-2 twill, as will be seen by comparing these with Figs. 4 and 5.

Unequal-sided twills—i. e., either warp or weft face—in some respects differ from those previously considered, and require correspondingly different treatment. They must, of course, conform with the general rule that

the direction of the twill should run in the opposite direction to the line of the fibres, as is illustrated in Figs. 10 and 11. Fig. 10 represents a 3-by-1 warp-face twill, woven with ordinary yarns, and with the twill running to the left, and Fig. 11 represents a fabric woven with similar yarns, but with the twill reversed.

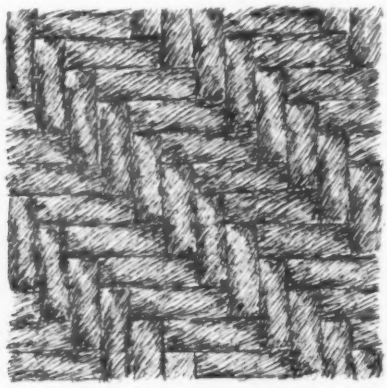


FIG. 8.

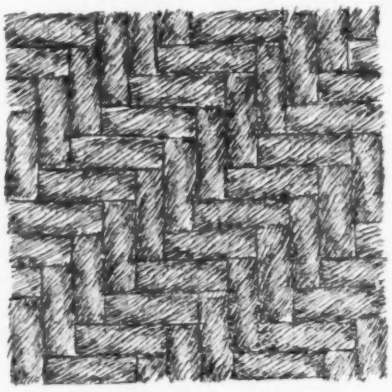


FIG. 9.

In warp-faced fabrics such as these, the direction of twist in the warp naturally exercises a much greater influence on the appearance of the cloth than the weft, owing to the fact that the floats are of greater length. The direction of twist in the weft has, however, an important influence on the prominence of the twill. It is well known among makers of these cloths that in many fabrics woven with warp-face twill weaves a more prominent and clearer twill is obtained when twist-way weft is used. As this forms an apparent exception to the general rule, it deserves further consideration.

Fig. 12 represents a similar fabric to Fig. 10, with the exception that twist-way weft is used instead of ordinary weft, so that in the weft the direction of the fibres is in the same line as the direction of the twill. Instead of this detracting from the boldness of the twill, it appears to have the opposite effect, as may be seen by a comparison of Figs. 10 and 12.

A little consideration will show that this apparent failure of the rule is in reality a further confirmation. In such a fabric the warp rib is usually required to stand up boldly, while the weft line of the twill should really form the division or hollow between the ribs. This being the case, the more the weft line is subdued the better will be the effect in the cloth. On the other hand, if the weft line is more pronounced, it will detract from the prominence of the twill by showing up a second series of ribs between those formed by the warp. It is therefore necessary, in order to give great prominence to the warp ribs, that any prominence of the weft rib should be avoided. This is exactly what happens when twist weft is used. The lines of reflection from the warp threads join

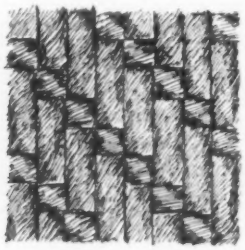


FIG. 10.

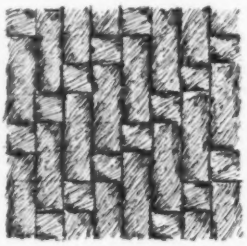


FIG. 11.

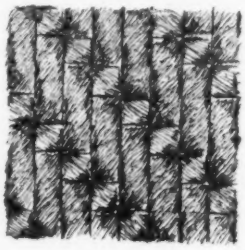


FIG. 12.

up so as to form a pronounced rib, while those from the weft threads run in the opposite direction, thus breaking the weft line and checking any tendency that it may have to show up boldly, and, in fact, causing the weft to form the hollow between the ribs.

The same principles also apply to weft-faced twills. If, for example, a weft-faced twill is woven with the twill line running to the left, the weft should be spun weft way; and it is probable that a bolder and sharper twill will result if the warp is also spun weft way, or, on the other hand, a bold twill might be made running to the right by using twist-way weft and twist-way warp. If, as is occasionally the case, a twill fabric is required in which the twill effect is subdued as much as possible, it is only necessary to apply the rule conversely, and run the twill in the same direction as the line of the fibres. Thus in the case of the 2-by-2 twill weave, the twill effect may be subdued either by using ordinary yarns and running the twill to the right, or by using weft-way warp and twist-way weft and running the twill to the left, and so on.

Another fabric which in some respects resembles the warp-face twills just dealt with is woven with the five-stave warp satin weave. With this weave a high-angle twill is produced which may be made to appear more or less prominent according to the direction of the treading and the twist in the yarns. This weave may be fairly considered to be a high-angle twill, produced by using only alternate ends of the five stave 4-by-1 twill. This is illustrated by the designs Figs. 13 and 14, which show the weave arranged in two possible directions. A cloth woven with Fig. 13 would show a twill running to the left, as indicated by the arrow, and one woven with Fig. 14 would show a twill to the right, the exact angle of the twill in each case depending, of course, on the proportion of warp and weft in the cloth. The rules which apply to ordinary warp-face twills should therefore apply equally well to warp-face satins.

If it is desired to produce a fabric showing a bold twill to the left, the weave shown in Fig. 13 should be employed, and the warp spun twist way, so that the direction of the twill will oppose the line of the fibres on the face of the cloth. If, on the other hand, a fabric is required of the true satin type, in which no twill effect is required, the above conditions should be reversed—i. e., the weave shown in Fig. 14 might be used with twist-way warp; or, if desired, the same weave as before (Fig. 13) may be used, and the warp spun weft way. In either case the direction of the twill will correspond with the line of the fibres on the face of the cloth, so that the lines of reflection on the warp threads will run across the line of the twill. By following this rule, and at the same time arranging the warp and weft in suitable proportions, the twill may be practically eliminated.

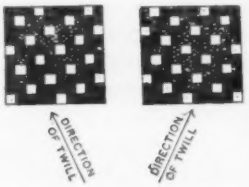


FIG. 13.

FIG. 14.

FIG. 15.

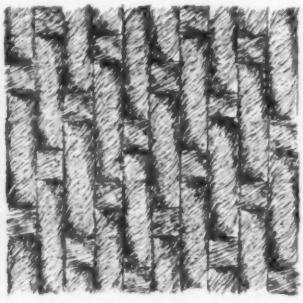


FIG. 16.

Fig. 15 represents a five-stave warp-face satin fabric, woven with twist-way warp and weft-way weft, with the twill running to the left; while Fig. 16 represents a fabric woven from similar yarns with the twill running to the right. In the first case the twill is thrown up boldly by the lines of reflection on the

threads running in the same direction as the twill, while in the second the twill line is broken by the lines of reflection running across, thus causing the fabric to show a smooth, even surface without any marked pattern of any kind.

The influence of the weft in these fabrics is much less marked than is the case in the warp-face twills, owing to the fact that the weft is scarcely visible on the face of the cloth, and also because the weft threads, where they do appear, do not join up to form a continuous diagonal line. It is usually stated that in a perfectly-constructed warp-face satin fabric the weft should be entirely covered by the warp, and consequently it could have no influence on the boldness of the twill. This perfect construction is, however, seldom met with in actual practice, at any rate in the cotton trade, the weft being usually visible to a greater or less extent according to the build of the cloth. The more the cloth falls away from the theoretically correct structure the more will the weft show on the face, and consequently the greater influence will the weft have on the appearance of the fabric.

This influence of the weft, such as it is, will be exerted in the same way as is the case with the warp-face twills, and in dealing with this point the same rules must be followed.

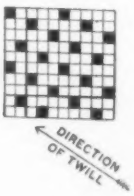


FIG. 17.

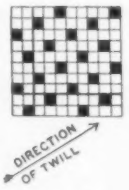


FIG. 18.

To get the boldest possible twill, it is therefore necessary to use a weft twisted in the same direction as the warp, for the reason explained in connection with warp-face twills. If, on the other hand, the twill effect is to be avoided, the best possible effect would probably be obtained by using weft twisted in the opposite direction to the warp, and running the twill in the same direction as the line of the fibres on the face of the cloth.

Weft-face satin fabrics will, of course, conform with the same rules. With the weft-face satin weave the twill produced, if any, will be one of low angle. The two possible designs are shown in Figs. 17 and 18, and the direction of the resulting twill indicated in each case by the arrows. If the cloth be required to show a bold twill, the weave shown in Fig. 17 may be used, and the weft spun weft way, or the design Fig. 18 may be used with twist-way weft. In either case the direction of the twill will be opposed to the line of the fibres on the face of the cloth. If, on the other hand, a fabric is required to show a smooth, even surface, the conditions will be reversed, and the weave Fig. 17 used with twist-way weft, or Fig. 18 used with ordinary weft.

By mistake, the warp thread in Fig. 1 in the last article was drawn twisted weft way instead of warp way. It should be understood as running in the opposite direction to that depicted.

JUDGING THE VALUE OF RAW SILK.

From Mittheilungen uber Textil-Industrie, Zurich.

From time to time serious disputes, often resulting in expensive lawsuits, have arisen between silk dealers and manufacturers, owing to the adulteration of raw silk. Recently a case of this kind arose in which Dr. Albert Mueller, of the silk dyeing firm of Baumann and Mueller, Zurich, was called upon to testify as an expert, and his evidence which follows is of much interest to the silk trade. The controversy was over the weighting of raw silk with foreign materials before it is boiled off and dyed, and the technical points were covered by the answers to the three following questions:

1. Is it a trade custom to allow the weighting of Italian raw silk with paraffine, vaseline, glycerine and soap to the extent of 5 per cent., without having such treatment of the material specified in the contract?

2. If not, what claim has the buyer on the seller?

3. Can the external and irregular weighting of raw silk cause difficulties in the dyeing process?

Dr. Mueller's answers to these questions were as follows:

1. The only object in handling Italian, French or Japanese raw silk with materials such as paraffine, glycerine, soap, etc., to the extent named in the first question is to increase the weight of the material. Such a practice has no other result than to defraud the buyer, and when he resorts to the practice he is guilty of fraud. The question is, therefore, to be answered in the negative. If the seller of the adulterated raw silk advances the claim that the goods are according to sample, it simply indicates that he is a stranger to mercantile morals. This plea should be firmly resisted, especially when it refers to such an expensive commodity as silk. The buyer of silk presumes in good faith that the selling sample shown him is pure silk and not silk containing five or more per cent. of foreign material. The Zurich code is unmistakable on this point: "Silk that has been weighted must be sold as such. The use of paraffine, vaseline and glycerine in the manipulating of Italian, French and Japanese silk is unnecessary and therefore inadmissible."

The use of soap in the Italian filatures is necessary in a few winter months. The liquor in the bassines is heated to 150 degrees F. and, consequently, the work room is filled with vapor caused by the lower temperature of the atmosphere. This vapor makes it difficult to handle the silk. At such times a small quantity of soap is added to the bassines in order to facilitate the winding process. The object, however, is to produce this technical effect only and not to increase the weight, although the weight is increased slightly,—at most not over 1/2 per cent., and frequently this increase is lost in the succeeding processes. The use of soap on Chinese silk is an exception to this rule. Such silk is ordinarily marked "soaped Chinese silk," and sold as such.

2. The buyer is right to reject deliveries of weighted silk. If, however, the silk is already in process of manufacture and if the defect in the goods is known he has the right to damages.

3. This question is answered in the affirmative. The modern dyer is called upon not only to color the silk, but also to weight it. This weighting is a development of the ancient and classic mordanting method and rests upon the characteristic property of silk to absorb large quantities of certain metallic oxides. The process of weighting silk has been perfected to such an extent that the dyer can within certain limits increase the weight to any desired degree. For example, the silk manufacturer orders the dyer to weight the raw silk 20 to 30 or 50 to 60 per cent. above its original weight. To do this the dyer must add weighting material to make up for loss in boiling off and also to give the desired increase of 20 to 30 or 50 to 60 per cent. It is, therefore, clear that the dyer is placed in a very difficult position when the raw silk which has previously been weighted is delivered to him with specific instructions as to how much it is to be weighted in dyeing. The dyer assumes the maximum loss of weight in boiling off and makes his calculations accordingly. If, however, the material is weighted with the substances mentioned in the first question, the loss in boiling off is correspondingly increased. The consequence is that the weight required by the silk manufacturer is not obtained and the deficiency brings the dyer in conflict with his customer. To avoid this the dyer must increase the weight of the silk to make up the increase in the loss by boiling off and this in turn injures the thread. The dyer thus goes from the rain into the watering trough.

Another serious difficulty is the irregular dyeing of the silk, for there is no doubt that vaseline, paraffine, glycerine and soap solutions go on the fibre in a very irregular manner. This defect, as far as soap, vaseline and glycerine are concerned, is removed by the boiling off process. Paraffine, however, sticks so firmly to the silk filament and is so irregularly distributed that the unavoidable consequence is irregular dyeing. The difficulty is worse with souple silk, the soluble material on which is simply loosened, instead of removed. The silk fails to absorb properly the mordanting and weighting material in those places where the vaseline or paraffine is found. We refer now to fancy colors. Moreover, the adulterants give trouble in the boil-off liquor which is used for dyeing.

Both the silk manufacturers and dyers

have a common interest in settling this question. Frequent disputes now arise which cast discredit upon Italian work. The general suspicion attaching to Italian raw silk is shown by the demand of the board of directors of the Zurich Silk Society that the members require the loss in the boil-off to be specified. The three questions are, however, of greatest interest to the silk dyeing industry, owing to the great effect which the weighting has upon the quality of the product. Consequently the trade should insist firmly that all methods should be avoided which injure the quality of so expensive a textile material as silk and which must bring discredit upon an industry of so much importance to Italy.

ENGLISH NOTES.

(By our Special Correspondent.)

A surprising unanimity is noted in blaming English handlers of wool or wool goods for an erroneous judgment of the market. It is conceded freely now that Continentals or Americans during the rise have secured great bulks of wool more cheaply by threepence per pound than English consumers. In a fit of scepticism the Britons waited until the cheap wool had gone elsewhere. And if the words of the importer may be trusted, Bradford is in a fair way to repeat its errors. But between the man anxious to sell and his cutomer loth to buy there is a natural discrepancy of opinion.

One Bradford merchant firm has emissaries out now in Patagonia seeking for cheap wools. Another house that last season had its own buyer in the River Plate States is not represented there directly this season. The exporters settled there have made their position very secure by their system of guaranteeing out-turns and by their virtual monopoly of the packing and sorting warehouse accommodation.

There are two suggestions floating irresponsibly about, which seem to gain force by being coupled. On the one hand it is alleged that the doom of silk noils has sounded for the time being. On the other it is said that camel hair is to have a vogue. Past experience indicates that this is not an improbable forecast. Silk and camel noils are alike also in this habit of springing into demand and then incontinently vanishing from view for years. Camel hair is always in moderate request for beltings, for some cloths sold in Hindustan and for hygienic underwear of the Jaeger type. Rumor has it that camel hair will be wanted for coatings and for dress goods. It rests with manufacturers to determine how the material would suit them and to decide on any purchase in anticipation of a probable advance.

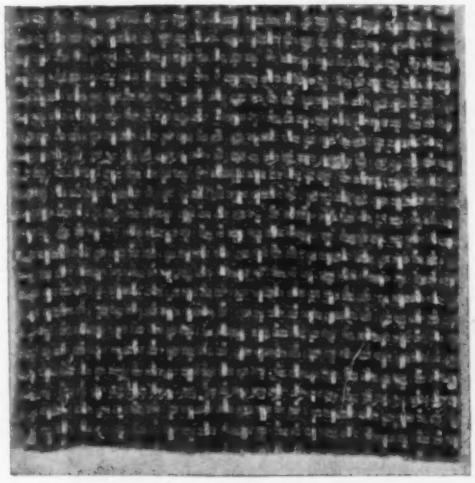
Summer dress goods now in the warehouses consist largely of the black voiles, grenadines and crepe de chines that were popular last season. In mohairs the trade is to be in colors rather than blacks, and a large share of attention is being given by merchants to find the best possible shades for stock. The choice is determined by the taste of the earlier buyers in the large West End shops of London, and as yet the selection has not been fixed.

Piracy of designs is a matter that has long troubled carpet, fancy suiting and lace manufacturers. Bitter complaints arise now from Nottingham, one aggrieved firm having received notice that three of its best styles are now being copied in Berlin before the season can be said to have opened. A cry goes up against allowing foreign firms to register designs here and obtain the same protection as British firms, while the Briton can only secure valid protection in other countries by arranging to manufacture thither. Apart from copying registered designs, the most aggressive pirates are compatriots rather than foreign firms.

Solid weaves in black and blue and very quiet variations on the pin-point, overchecked designs in fancy suitings are likely to be the Huddersfield styles in 1905. Makers will not be reluctant to revert again to the plain cloths which for so long have been out of the market.

Dress-goods show a similar trend towards plain effects. Bold splashes, loops and knickers are of the past. When fancy costume cloths are considered, even they reveal an inclination towards simplicity. A popular

line in these goods, for the cheap trade, sells at the mills for 17 1/2 cents in 45 inch width, 8 1/2 ounces weight. A style from this line is shown in the accompanying illustration. It is a cassimere weave with overchecking, made by a Guiseley woolen firm, and containing perhaps as much as ten per cent. of pulled wool with the black warp threads in solid cotton. The remainder of the warp is angola so spun that the handle is full while the cloth is firm. Shades of blue-gray preponderate and the overchecks are bright blue or blue twisted with red. Goods of this type sell well for export and in some countries they are made into creditable suits for men and boys. The probabilities are that this line of goods would suit a considerable portion of wearers in the United States.



Thomas Balmer, in his article in the December issue of the Textile World Record estimates the consumption of stockings in America at a dozen pairs per year per person. It is not to question this estimate that the reference is made. It would be very near the truth to say that in Great Britain the destruction of stockings goes on about one-third as fast. This is explained less—one supposes—by the American walking-pace than by the quality of the materials ordinarily sold. Ladies back from New York have complained of the disastrous cheapness of American hosiery, which costs one-half or less than that currently sold here, and yet is much more expensive in the long run. Reasons to explain it exist, yet the anomaly remains that England beats all comers in the desperate cheapness of its woven fabrics and is beaten by several nations in the cheapness of its knitted goods.

One of the by-processes of the English trades is the crimping of seal-cloths. For some years the handful of Yorkshire manufacturers of mohair and silk plushes have had their cloths crimped in a somewhat extraordinary way. A septuagenarian hand-loom weaver devised a primitive machine for the purpose and acquired such skill in its manipulation as to attract all the best of the local custom in the Mirfield neighborhood. The essentials of this frame are a narrow trough down which the cloth at width is stuffed in a studied disorder. With a fork the operator pushes the cloth through weighted nip-rollers which are heavy enough to make distinct creases in the fabric. From thence the cloth, opened loosely, passes to rollers covered by canvas into and through which steam is passed. Thus the crimp-marks are fixed and the cloth is thereafter delivered. The aged inventor of this simple but effective apparatus is by far the most competent operator of it. There is an art apparently in the hasty rucking-up of the piece which others have been slow to acquire. From being an independent commission-worker the operator has passed with his machine into the employ of the well-known firm of T. F. Firth & Sons, Ltd. Though the market for crimped goods of the seal character is not large it is looked on as a lucrative one. Very high prices are paid for the more elaborate goods used in making babies' coats.

At present there is perhaps some technical interest in the fact that hand-loom weavers can yet make a small livelihood here and there in Britain. In an obscure nook flourishes a craftsman who weaves linsey-woolsey cloths for aprons for butchers' wear. The financial success of the business hinges on the ability to buy job lots of cheap yarn. These at the same time must be of stouter material than the flimsy stuff usually employed by the recognized power-manufacturers.

It may pain some British cotton growing enthusiasts to read news just through from Australia. It is said that attempts to be made in the Commonwealth are dictated less by love of Lancashire than by a desire to found a cotton manufacturing industry in Australia. Altogether the aspirations of our colonies appear to be distinctly less altruistic than some of our statesmen like to admit. Lancashire reposes more confidence in the prospects of raw cotton from the Niger basin and thus far the Nigerians have not threatened to build cotton mills in their swamps.

LOW GRADE WOOLENS.

BY "DELAINE."

(Copyright, 1905, by Lord & Nagle Co.)

III.

Having found the raw material for low grade woolens, the next question is the use of the same. We should first decide what cloth is to be made, and then select suitable material from the classification already made. Let us take a cheap union serge, i. e., a cloth with cotton warp and shoddy weft. The coarse cheviot rags form the weft for the same, and the various colors, into which they have been sorted will give a distinctive and serviceable cloth. We have dark, medium and light greys, dark and light browns, fawns and drabs, to which may be added black and blue, whether from the assortment, or dyed in the piece; the whole combining to form a range of shades which delights both the seller and the buyer. For the mixture shades, a warp spun from American cotton has sufficient strength; but for the goods dyed in the piece, the warp should be from Egyptian cotton, which has more strength and withstands the action of the dyewares better than American. If that point is not observed, tender cloth is the frequent result and the goods are rejected.

Then with regard to the weft to be spun from the cheviot rags. If they have been pulled with the care previously advised, and the fibres left as long as possible, the material requires very little support to make it spin. From five to ten per cent. of rough Peruvian cotton is ample, and the two should be carefully blended in the picking room.

FIG. 8. ST. PETER'S MILL, LEEDS, ENGLAND.

The mistake is often made by using American cotton instead of Peruvian. The fibres of the latter being coarse, open and curly, they assimilate better with those of wool, and half the quantity will suffice. Another mistake is that of employing too much cotton. The experienced manufacturer employs as little as possible in his weft, and avoids it altogether where he can. When cotton is mixed with wool, the cotton asserts itself too much and has a flattening effect upon the wool fibres, which is manifest both in the yarn and the woven cloth.

If required, all the shades would dye black, but only the drab and fawn are suitable for blue. A gray yields a mottled color when dyed blue. This range is much in demand by the slop clothing factories for the production of sailor suits for boys. The details of construction are as follows: Warp 2/30's cotton, 1,800 threads, 60 inches wide in the loom. On 4 healds, straight draft. Reed 15 dents per inch, 2 threads per dent. Weft spun 1 run (100 yds. per oz.) and woven with 30 picks per inch. Fulled to 54 inches wide, and finished 54 inches. Half rough finish.

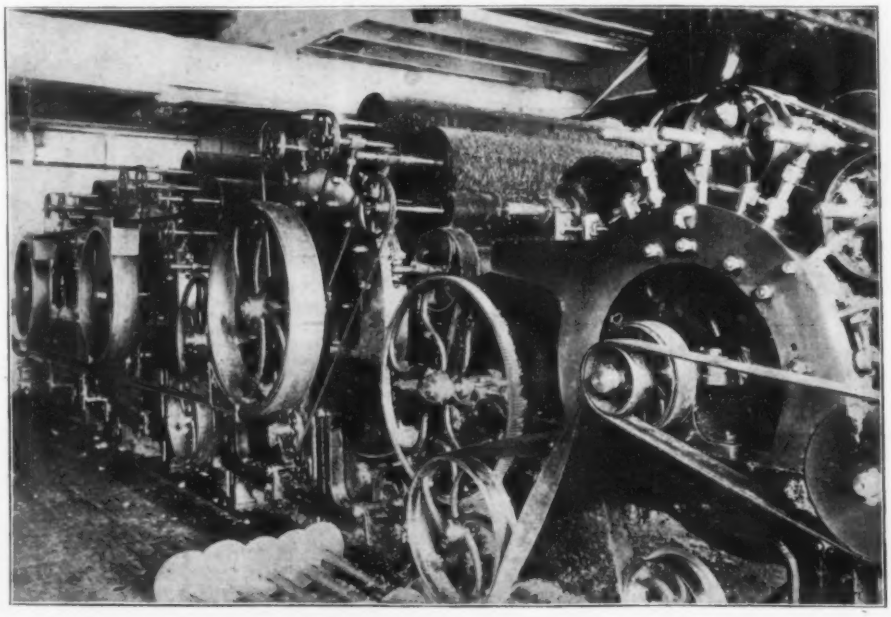


FIG. 9. A "SCRIBBLER" CARD IN ST. PETER'S MILL.

If sufficient oil has been placed upon the rags before pulling, a further addition is not required in the picking room, and in no case should it be applied to the cotton. In the blending, much care is requisite to ensure an even distribution of the cotton, and that may be attained by mixing the cotton with one-fourth of the shoddy and then forming layers of that mixture with the other stock. The pile should then be broken from the side, shaken together in a second pile and passed through the teaser, when it is ready for carding.

The weave or design is the 2 and 2 twill.

By way of turning the foregoing blends to further use and also improving their quality, an addition of 20 per cent. of white wool, or garnetted waste, will suffice. The weft may then be spun to 1 1/2 runs (150 yards per ounce) and the cloth woven with 36 picks per inch. The result is a superior and useful cloth from the same details of warp, and one available for women's winter skirts in cold climates.

A third range is obtained by dyeing the 20 per cent. of wool in fancy colors, such as

blue, lavender, fawn, etc., when the blends assume a brighter tone. The same details of warp are retained.

A lighter cloth, yet smart in appearance, is obtained by placing the warp on three healds, and the three-shaft twill, or prunella weave. The cloth has a weft face which covers well and is not easily surpassed in elegance. For warm winter wear it is available both for ladies' and children's garments. In order to obtain solid shades, the cotton warps are dyed and sized before weaving, in suitable colors to match the wefts. If the manufacturer who desires to produce the foregoing ranges of cloths will study and faithfully adhere to the details given, his efforts will not be met by disappointment. His chief danger will be in fulling the fancy colors too much and spoiling them. He will be wise in avoiding that, by leaving the cloth extra wide, if need be.

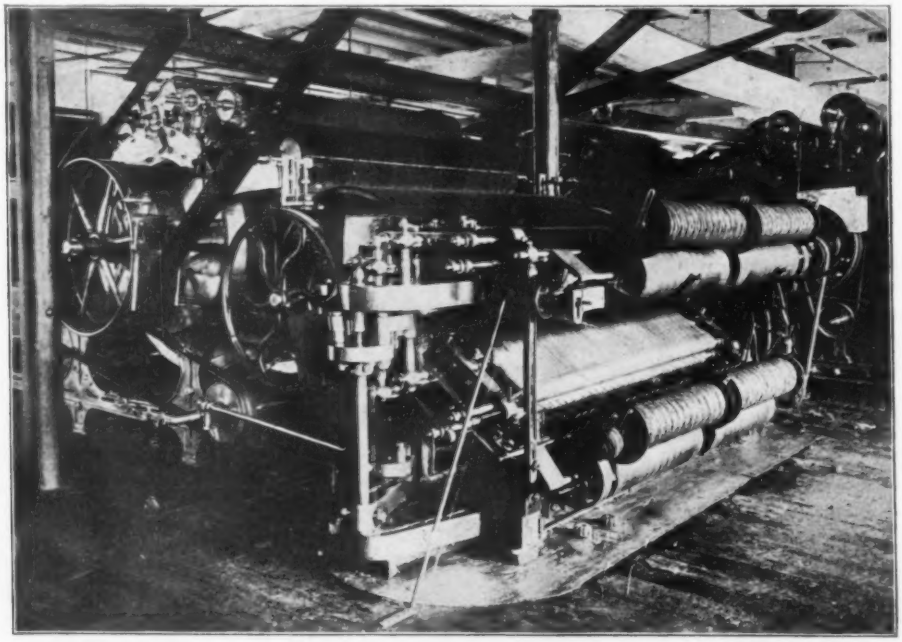


FIG. 10.

ILLUSTRATIONS.

The best low grade woolen factory in Leeds, England, is the Cardigan Mill, replete with the most modern appliances for every process through which the material has to pass. Raw material enters the gates in bales of wool, cotton and rags, but goes out again as finished cloth. The founder and owner of the present firm died last year, having commenced life as an operative, but leaving a fortune of $400,000.

Fig. 8 shows St. Peter's Mill, Leeds, which produces cheap woolens for the slop clothing trade second to none. This factory is always well employed and working overtime, and the head of the firm, Mr. Frank Muff, most willingly accorded the writer permission to photograph his mill and machinery specially for this article.

Fig. 9 shows a "Scribbler" in St. Peter's Mill. This is the first carding machine the wool enters. Much importance attaches itself to this gigantic machine, which is virtually two machines in one, yet a true example of the type of machine required in the manufacture of low woolen goods. The view shows the machine in actual work with material passing through it. Details will be given in the next article.

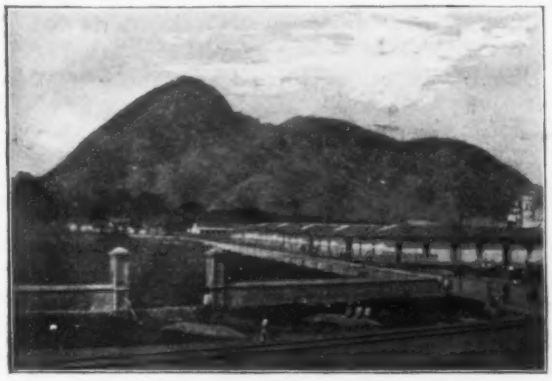
Fig. 10 shows the second carding machine.

the two, Figs. 9 and 10, forming one complete set of carding machines. Fig. 10 has one cylinder less than Fig. 9, but is not fully shown, as the view is taken from the end, where the material is first delivered in the form of a thread. A good view of the condenser, which effects the delivery in rolled sliver ready for spinning, is here given. This important process will require special description, since several types of condenser exist, some of which are not successful in low goods.

A MEXICAN JUTE MILL.

BY F. J. BEGG.

The Santa Gertrudis jute mill at Orizaba, Mexico, is the first factory on the route of the Ferrocarril Mexicano going from Vera Cruz to Mexico City. It is the first respectable building to be seen in the whole eighty miles of country between it and the Gulf of Mexico, and as it suddenly comes in view is usually an object of curiosity to railroad passengers. Especially is this so at night, when the substantial white building under a blaze of electric light, contrasts strongly with the rugged country surrounding it.



VILLAGE OF SANTA GERTRUDIS, MEXICO.

The mill is reached by taking the train to Orizaba, an old fashioned city whose trade is largely in coffee and sugar. Mule cars run from Calle 50 de Mayo to the village church at Santa Gertrudis. The conductor on these cars is very obliging and should you notice a friend on the sidewalk, which is the only place fit to walk on, he will hold up his car and allow you to exchange greetings. On passing the workers' houses the visitor first encounters the dwellings for Europeans, the reading-room, stocked with American and British publications and weeklies, also the general manager's house, locally known as the "casa grande."

The mill itself is about fifty yards farther on and occupies a rectangular plot. This building is simply a steel frame covered with corrugated sheet iron. There are no windows in the sides,—they can't be called walls,—but an exceedingly uniform light is obtained from the saw-tooth room lights. The raw material is unloaded from the cars on a switch which brings it within a few yards of where it is first required.

In the preparing room where the jute goes after the bales have been broken and softened, the cards are driven by individual motors and the necessary speed reduction is obtained by means of a countershaft. At one time the cards were directly connected to the motor by means of a wheel and pinion, but breakage of teeth, etc., caused this method to be abandoned for a belt drive. The cylinder shaft, however, had only room for a tight pulley and this arrangement had the disadvantage of requiring three or four men to start a card, owing to slipping of belts, etc., and the high speed at which the motor started. The rest of the preparing machinery with the exception of several roving frames, was grouped.

The spinning room was driven by a line shaft divided at the centre and driven from each end, so that a section could be stopped if desired. This did away with the excessive oiling which would otherwise have been necessary. At one time I believe each frame had its own motor. The spool winders and cop winders, dressing machines, etc., were each grouped to separate motors.

In the weaving shed, shafts were laid in tunnels, between each line of looms with a motor belted to each shaft. The weavers, who were all men, used to make trouble by allowing the motors to race. This soon destroyed the commutators and caused a danger of fire from the sparks.

In the finishing department, the printers, folders, calender and packing press were self-contained, while the sewing machines were driven from a line shaft.

with one hour off. A separate lot of help were always on the night work. On single shift work, the hours were from 6 to 8.30 p. m., with an hour and a half for meals.

TRANSMISSION LINE GOING TO THE MILL.

The dyehouse and drying stove were in a separate building among some coffee trees away from all danger of fire. Women attended the warp spinning frames and men the weft.

From the mill, an electric trolley runs through a cattle, coffee and banana ranch, to the brink of a deep canyon in which the Rio Blanco rages. Nestling at the foot of

DISTANT VIEW OF MILL AND HOUSES.

Cop winders were men and warp winders were girls. When working two shifts the hours were from 6 a. m. to 6 p. m., with an hour and a half off, and from 6 p. m. to 5 a. m.

the Rincon Grande Falls is the power station, continually in a shower of spray and almost unapproachable. Water is diverted from the river a few yards above the falls and led

through three pipes, two for power and one for lighting. The current for power is generated at 400 volts, while the light plant, which is a separate installation, is led to the transformers at the mill, at 2,200 volts pressure.

FINISHING ROOM HELP. ALL MEXICANS.

The mill has 216 looms for carpets, burlap and Hessian; 1,996 spinning spindles, 200 roving frame spindles and 378 twisting spindles, and on this total the taxation of the mill is based. For the first six months of 1901 the production was 1,702,913 pounds and for the same period of 1902 it was 2,537,003 pounds of manufactured goods. The material consumed when working both shifts is approximately 50 tons per week, working six days per week and five and three quarter nights. The number of bags manufactured for the first six months of 1901 was 417,242, and for the second period the number was 821,895. These bags vary in weight from two and one-quarter to three pounds. Wages are very much lower than in either Europe or the United States. Card hands receive 62 cents a day of 10 1/2 hours, drawing frame hands get 45 cents; rovings, 55 cents; doffers, 27 to 22 cents. Warp spinners have 50 cents and weft spinners 70 cents a day. Machinists, oilers and motor tenders are paid from $1.25 to $2.25 a day. It must be borne in mind,

THE GATE MAN AT SANTO GERTRUDIS.

WORKMEN IN THE BATCHING DEPARTMENT.

however, that these rates must be divided by a little less than three to give the amounts in United States money.

Owing to a Mexican's liking for property not belonging to himself, elaborate precautions are taken against thieving. Every evening six well armed watchmen are posted around the entire property and every half hour positions are changed. Before leaving the factory all operatives are searched, but the searchers are most likely in league with their fellow workmen. The mill has now been running over ten years and at present extensive alterations are being carried on, among which is the discarding of the small 2, 4 and 8 horsepower motors far larger ones of 80 to 100 horsepower.

Several attempts have been made to grow the jute plant in the neighborhood, and also at the isthmus of Tehuantepec, but with scant success. At present all the raw material has to be imported from Bengal through the London markets. The Mexican Government is doing its utmost to encourage manufacturers by granting concessions of water power protection and free importations, and in some cases of installations of machinery.

THE CHURCH AT SANTA GERTRUDIS. IT RULES THE PEOPLE.

In 1903 there were collected in the kingdom of Servia 345,000 pounds of silk cocoons and the government annually distributes large quantities of the eggs of the silkworm free of charge, in order to encourage the industry.

COTTON GROWING IN AUSTRALIA.

At the recent show of the Royal Agricultural Society of Victoria, at Melbourne, were exhibited two new varieties of cotton reported to be of exceptional quality, grown by Doctor Thomatis, at Cairns, in the State of Queensland. Doctor Thomatis stated that one variety, named Caravonica I, gave the large yield of 1,200 pounds of ginned cotton per acre, and that it has been pronounced by American, English and Continental experts to be of the value of 10d. (20 cents) per pound and should be classed as a wool cotton. The other variety, named Caravonica II, the yield of which is not stated, is a silky cotton valued at 1s. (24 cents) per pound.

Caravonica I in yield and value is stated to be far in advance of all other cottons, and applications for seed have been made from many countries. It is a tree cotton and is cultivated like an orchard tree. It is planted 7 feet by 7 feet apart and when 6 months old attains a height of 7 feet and bears a small crop the first season. Slight pruning is necessary each year to keep the tree robust and of a convenient size for working. From 300 to 500 bolls are said to be yielded by a single tree in a season; and it is claimed that 70 of these bolls will make from 1 3/4 to 2 1/2 pounds of clean lint.

Much interest is being evinced in Australia in the possibility of successfully

growing cotton in the northern portion of the continent. This part of Australia is stated by experts to be eminently adapted for the purpose, having distinct rainy and dry seasons. The governments of the States of South Australia and Queensland intend to offer every facility for cotton growers to secure land in the northern territory of those States and in other ways to encourage the industry.

An association has been formed in Manchester, England, to encourage the cultivation of cotton in the British Empire. Agents of this association are now in Australia and in Fiji, and are in communication with the governments of the States in which the climate and the soil are adapted to the industry, and are otherwise arousing interest in the project.

JOHN P. BRAY.
Consul-General, Melbourne.

COTTON MULE SPINDLES.

BY A FITTER.

To get as high a production in the mule room as in other rooms in the mill, one must look after details, and one of the most important details is the spindles. If the spindles are not properly set or are defective in any way, poor work and a low production will be the result. The mule should be of the proper gauge for the length of the spindle used, so as to yield the highest production and give a cop of the right size for convenient handling A good gauge for different lengths of spindles above the bolster would be as follows:

Gauge.		Height of Spindle Above Bolster.	
2	inches	9	inches
1 3/4	inches	9	inches
1 1/2	inches	8 1/2	inches
1 3/8	inches	8 1/4	inches
1 5/16	inches	7	inches
1 1/4	inches	6 3/4	inches
1 3/16	inches	6 3/4	inches
*1 1/8	inches	6	inches

*For very fine yarn.

The spindle steps and bolster also require attention. The steps should be deep so as to allow plenty of oil, and should have covers to prevent the oil flying out when the mule is running. The loose or flexible bolster is the best. With the flexible bolster a higher spindle speed can be obtained than with any other kind and the mule runs lighter. There is also a saving of oil and each spindle can be taken out without disturbing the bolster rail.

The setting of the spindle should be attended to carefully. The spindle is made of steel and is of the same diameter from the step to the whorl, but from the whorl to the point it is tapered as much as is possible while still retaining its necessary rigidity. The reason for this is to facilitate the removal of the full cops, and to allow the coils of yarn to slip over the spindle point while twisting. If the point of the spindle was of the same diameter as the base, the coils, as they are slipped over the point of the spindle, would cause a slackness between the rolls and the spindle and make snarls and kinks in the yarn. For the same reason the spindle point is rounded in a conical shape.

The spindles are set lower than the rolls. If they were not set lower the yarn would be wound on the point of the spindle and break. Being set lower the coils of yarn slip over the point of the spindle and twist is thus put into the yarn. The distance the spindles are set below the rolls depends on the distance that the carriage travels at one stretch. It will be readily seen that the farther the carriage is from the rolls the more acute will be the angle formed by the yarn and the spindles, and consequently the more strain will be put on the yarn in slipping over the point of the spindles. For a 64-inch stretch a perpendicular line dropped from the top of the steel roll to the point of the spindle should be 2 3/4 inches. As the spindle can be set lower than the rolls only within certain limits, the length of the stretch is generally reduced for fine yarn.

In order to help the coils of yarn slip over the spindle point, the spindles are inclined toward the rolls. The degree of inclination varies for different counts, for yarns between 20s and 40s it is 14.33 degrees. More inclination is given the spindle for fine yarn than for coarse yarn, the reason being that fine yarn will not stand as much strain as will the coarse yarn. If the yarn breaks more than it should when the mule is nearing the end of the stretch, it is a sign that the spindles

are not set straight; they may be too high or the stretch may be too long or the spindles may not be inclined enough. Too much inclination will cause the yarn to slip from the end of the spindle when the mule is in, and put kinks in the yarn.

The spindle should be as nearly true as possible so as to run with the least resistance. Bent spindles and worn steps or bolsters should be replaced with good ones, as enough yarn is spoiled with them to pay for new parts in a short time. The spindles should also be kept clean and well oiled. Cheap oil should not be used as it will gum and make the spindles stick, requiring more power to drive the mule and making bad work. An oil of medium or light gravity is preferable; not so light as to leak through the steps, and not so thick as to make additional friction. The spindle banding should be of a good quality of yarn, as it will last longer and prove more economical than a cheap grade. The chief requisite of a band is that it shall not stretch. The tension should not be so high as to cause unnecessary friction, nor so light as to allow the spindle to slip and make soft yarn.

TESTING FULLING SOAPS.

According to Moraiwski and Demski, several points have to be considered in testing soaps intended for use in milling. The soap should first be subjected to an ordinary chemical analysis. In this it is necessary to determine the amount of water in the soap, the amount of free alkali and unsaponified fat, if any, and also the quantity of any adulteration or filling, such as rosin, water glass, etc., etc., that may be present.

After this, if the first investigation has turned out satisfactory, the spinning test should be applied. This will show whether the soap is capable of forming a paste having the necessary toughness for milling purposes. Cut ten grammes of the soap into very thin shavings, and dissolve them over the water bath in 100 c. c. of water in a beaker. Then stand the beaker in cold water, and stir the solution, which must be quite free from solid particles, with a thermometer, until it will draw out into threads. The temperature probably depends upon the fusion points of the fatty acids of the soap, but it is independent of the amount of water in it. Nevertheless, the spinning temperature decreases much faster than the melting points of the fatty acids. A tallow grain soap, the fatty acids of which melted at 43.5 deg. C., spun at 43 deg., while a Marseilles soap, with fatty acids melting at 26 deg., would not spin until the temperature was as low as 4 deg., so that it was useless for milling.

The spinning temperature it raised by fillings, as the table below shows clearly. It contains the results of spinning tests executed as above directed. The temperatures are indicated by the Centigrade scale.

Kind of Soap.	Melting point of the fatty acids.	Spinning temperature of the pure soap.	Filling.	Spinning temperature of filled soap.
Tallow Grain Soap	45 deg.	41 deg.	20% Carbonate of Soda	70 deg.
" " "	45 "	41 "	15% Common Salt	70 "
Marseilles Soap		25 "	15% "	60 "
Sulphur Oil Soap		8.5 "	10% "	54 "

In cloth factories it is customary to use these filling materials with the soap. For example, say, 89 lbs. of soap containing 25 per cent. of water is used with 36 lbs. of carbonate of soda and 875 lbs. of water.

As regards the use of soaps in textile industries, that which requires the best is silk-dyeing. Here free alkali, whether caustic or carbonated, and also saponified fat, are all inadmissible. The wool trade also requires soap perfectly free from alkali or alkaline salts, except in the production of inferior qualities of goods. A good milling soap must be free from excess either of fat or alkali, must have a great detergent power, and must assist the felting during the milling process.

One of the worst impurities of a milling soap is water-glass. It has a mechanically-abrading action on the wool, as well as a corrosive effect on it. If there is much of it, too, it often coats the fibre and gives the milled cloth a very bad feel. Both hard and soft soaps are used for milling. The best fats to use in their manufacture are tallow, palm oil, and sulphur oil. Rosin is a very harmful filling in a milling soap, and, in short, the standard to be aimed at is a soap consisting solely of pure fatty acid salts of soda or potash. It need hardly be said that a washing powder, or even a powder professing to be pure soap in a ground state, should never be used for milling purposes.—Weiner Seifensieder Zeitung.

Questions and Answers.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Cotton Yarn for Export.

Editor Textile World Record:

We have an inquiry from Europe for single 18's and 20's cotton yarn. Can you give us the address of an American firm making a specialty of exporting yarn? Hold Fast (508).

In the Textile World Record Directory our inquirer will find a list of the leading yarn merchants in the country.

Cotton Batting.

Editor Textile World Record:

I would like to get some information regarding the most improved processes of making cotton batting, used in the manufacture of mattresses, comforters, stair pads, etc. Felt (512).

This question is answered by an article in another part of this issue.

Moisture in Textile Material.

Editor Textile World Record:

We are running 120 looms on worsted and cotton worsted goods, buying all the yarn required, and have difficulty with the variation in the weight of the goods, especially the woven weight per yard. For example, one standard grade of our worsted goods is made with 2/30 warp and filling. Two months ago this fabric weighed about 16 ounces per yard from the loom and finished about 14 1/2 ounces without any change in length. Today we are making the same fabric from a different lot of 2/30 yarn bought from the same spinner, and the goods average about 17 ounces per yard from the loom and, curiously, finish about 14 1/2 ounces with no change of length, the same as with the old lot of yarn. Following are the particulars of two average pieces made from different lots of yarn.

Old lot, woven 45 yards, 16 ounces.
Finished 45 yards, 14 4/10 ounces.
New lot, woven 48 yards, 17 1/10 ounces.
Finished 48 yards, 14 4/10 ounces.

At present we are weaving about 2,500 yards of this style per week. What is the reason for this variation in the woven weight? Neither the fabric nor the process of finishing has been changed.

Perplexed Weaver (500).

From the foregoing statement of the case there can be but one conclusion. The new lot of yarn contains a larger proportion of moisture, oil or other material beside wool. The excess of foreign material is removed by the finishing process which leaves the finished weight the same in both cases. This is shown as follows:

Cut from old lot, woven, 45 pounds.
Finished, 40 1/2 pounds.
Loss, 10 per cent.
Cut from new lot, woven, 51 1/4 pounds.
Finished, 43 1/4 pounds.
Loss, 15 8/10 per cent.

In other words, for every 100 pounds there was 5 8/10 pounds more oil or water in the new lot of yarn than in the old lot. As the fabric was made with the same number of ends and picks per inch, it follows that the new lot of yarn must have reeled heavier than the old lot, before weaving.

The fact that the finished weight is the same in both cases indicates that the variation of the woven weight is due to an excess of moisture and not of oil. If there had been an excess of oil the spun yarn would have reeled the same because the oil is applied to worsted in the combing room and the yarn is spun in the grease. The excess of oil would thus have caused no change in the woven weight, but the removal of the oil by finishing would cause the finished goods to weigh less than when made of yarn carrying a smaller quantity of oil. This, however, is not the case with the pieces referred to, and we are, therefore, forced to the conclusion that the increase in the loss of weight by finishing is due to the presence of 5 8/10 per cent. more moisture in the new lot of yarn than was in the old lot.

Wool is extremely hygroscopic, probably more so than any other textile fibre of commerce. It has been estimated that some grades of wool will absorb 30 to 40 per cent. of moisture without feeling damp to the touch. This fact makes it possible for unscrupulous persons to load raw and partly manufactured wool with an excess of moisture and thus obtain the price of wool for water. This loading of wool materials with moisture is usually accomplished by storing in a damp cellar, which is probably the best paying room of many a yarn mill. Other methods are available, such, for example, as the one we once found a wool dealer practicing. Entering unexpectedly the loft in his country store in the West we found him standing in the center of a pile of wool industriously sprinkling water over the stock with an ordinary garden sprinkler.

This evil has been reduced to a minimum in Europe by the process of conditioning, which consists in determining what the weight of the textile

material would be if it contained the legal standard of moisture. On the Continent conditioning houses are organized and managed under legal restrictions, and their decisions are authoritative in commercial transactions. In England a conditioning house was established in 1895 by the Manchester Chamber of Commerce. In the United States we have the New York Silk Conditioning House. The legal standards of moisture adopted on the Continent are as follows: Worsted, 18 1/4 per cent.; woolen yarn, 17 per cent.; cotton, 8 1/2 per cent.; flax and hemp, 12 per cent.; jute, 13 3/4 per cent.; shoddy yarn, 13 per cent., all based on dry weight. For example, 118 1/4 pounds of conditioned worsted contains 18 1/4 pounds of moisture.

The different standards are made necessary by the variation in the wat r absorbing capacity of the various fibres.

The conditioning of textile materials sold in the United States has been neglected. This has doubtless been due to a number of causes, among which may be mentioned the great distance separating mills, which make access to a central conditioning house expensive; to the indifference of those who are injured by a lack of a standard of moisture; and to the natural disinclination of dealers to surround commercial transactions with restrictions.

The importance of conditioning is well illustrated by the case of Perplexed Weaver. He is now making 2,500 yards per week of one style alone, and on the basis of the two pieces noted he is buying for this part of his production 145 pounds of water per week at the price of worsted yarn. We do not know what the cost of the yarn is but at 75 cents he is paying $108.75 per week for water which he thinks is wool, or at the rate of 4 1/3 cents per yard. The chances of loss in this way are greater with wool than with other textile materials, owing to the greater power of wool to absorb moisture.

In the absence of conditioning establishments buyers of yarn can in a measure guard against this species of fraud by carefully reeling the yarn as soon as it is received and again after exposing it to a certain temperature for several hours, then noting the losses.

An excess of oil can be detected by scouring by hand the reelings used for the water test and noting the additional loss. These tests are necessarily crude, but will serve as a guide in the absence of reliable conditioning establishments.

Quick Retting of Flax.

Editor Textile World Record:

Please give me some information regarding the so-called quick-retting processes for flax. Are any of them commercially successful or likely to become so? Oregon (506).

A number of quick-retting processes for flax have been proposed during recent years and while most of them have been abandoned as impracticable, there are a few that are being exploited at the present time. We believe that no one of them is being used on a commercial scale, and while previous failures in this line raise doubts as to success, it would be presuming too much to conclude that quick-retting could not be a success because it has not been. We publish in this issue an article on this subject by a well-known fibre expert, which bears directly on Oregon's question.

Absorbent Cotton.

Editor Textile World Record:

I would like to have some information regarding the process of making cotton absorbent. Hydrophile (511).

The fatty and resinous matter is first removed by successive washings in solutions of soda. It is then treated in a solution of chloride of lime, immersed in an acid solution and rinsed in pure water. When properly prepared absorbent cotton should absorb 18 times its own weight of water. The following detailed account of the process is taken from a recent number of the Journal of the Society of Chemical Industries:

"Absorbent cotton should be made from the type of cotton known as Texas strict middlings, as other grades give inferior results. An unbleached absorbent cotton largely used on the Continent is made by simple extraction of the fatty matters by the aid of solvents. The best bleached product is made somewhat as follows: Washing in water; alkaline hydrolysis, consisting of a boil with 1 per cent. caustic soda for 12-48 hours under low pressure; washing; oxidation with hypochlorite of lime or soda, the latter being the best (the action is prolonged and the solution should contain about .01 per cent. chlorine, the cellulose itself is partially oxidized and shows oxycellulose reaction); hydro-extraction; acid treatment in a 2 per cent. solution of sulphuric acid; washing and hydro-extraction; a second alkaline hydrolysis, consisting of a short boil with 0.25 per cent. caustic soda; washing and hydro-extraction; a second acid treatment; prolonged washing: treatment with anti-chlor or a solution of soap; final washing. Sterilization by steam or by formaldehyde gas is also done in some cases. Mechanical processes for the preparation of the fibre are also necessary before and after the chemical treatment."

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 232 to 253. Also Buyers' Index.

KNIT GOODS SITUATION.

A year ago this time buyers were endeavoring to place additional orders on cotton knit underwear at prices quoted in December and early January, and it was the manufacturers' privilege to turn them down and to keep boosting the price from week to week, but at this writing the situation is quite the reverse. Buyers are asking for lower prices on the orders they have already placed, and it has taken all of the manufacturers' time and efforts to keep the orders on his books at steadily reducing prices. In order to do this it is necessary to make changes on the copies of the orders already placed with lower prices, better terms or discounts.

The effect of the break in the "gentlemen's agreement" on the price of fleeced goods has had the effect of unsettling the whole market on cotton goods, and the indications are that this season will be one in which the manufacturers will have a long drawn out and expensive selling season. Far sighted buyers are unanimous in saying that a further reduction in prices would be a detriment rather than a help to them, as a reduction in their costs means to them a reduction in profits, and we have heard several buyers say that it would be better for all concerned if there was no such thing in the market as a fleeced garment under $3.50. The break in the above mentioned agreement has not only had the effect of lowering standard fleeces from $3.37 1/2 to $3.25, but has also lowered those that are not consisered standard from $3.25 to $3.12 1/2.

Buyers do not appear to be anxious to place any volume of orders at the present time, although manufacturers of standard goods seem very earnest in saying that the price limit has now been reached, and that it comes dangerously near to the actual cost of production, even if it should be possible to buy further supplies of raw material at considerable less than today's prices, as the average will have to be struck with the supplies now owned at higher prices. The manufacturers of sub-standard lines state that they may be able to make some slight improvements either in the matter of weight or better trimming, but the buyers who place their orders now will be protected, and we cannot see that they take any chances.

A further reduction in the Morris Mills line of two thread cotton ribbed shirts and drawers from $3.50 to $3.37 1/2 has had the effect of tumbling nearly all other lines of twelve pound ribbed goods in about the same proportion. Those previously shown at $3.35 to $3.40 are now quoted at $3.25, and the Fuld & Hatch line is now quoted at $3.50 instead of $3.62 1/2. Jobbers are not particularly pleased with these changes in prices, particularly on the lower numbers, as it means that this class of goods will reach the retailers for 39-cent lines, instead of 50-cent goods, and he sees another line on which his margins are reduced proportionally. Robert McKinnon has reduced his ladies' seven pound ribbed vests and pants to $1.80, and the eight pound goods to $1.90. It is said that these are made from waste yarn, and some manufacturers will not make prices in competition with them, but at the same time buyers use these quotations as a handle, and many of them buy large quantities of this class of garments. A number of travelers from jobbing houses are now out soliciting fall orders, and although they are booking some orders yet, there is a general hanging back among a great many retailers who tell the salesmen that they will let business go until next trip, or else give an open order without assortments or in some way keep a string on any order they place.

Wool goods are selling quite freely, which of course is to be expected on the present advancing market. Some manufacturers claim that they are selling exactly the same

goods as last season at the same prices, but most of them will admit that either there is less wool and more cotton, or that the percentage of cotton and wool are the same, but that the wool is of a lower grade. Manufacturers are having their greatest difficulty in making up a line of scarlet goods, and one manufacturer who has been making a scarlet at $7.50 now asks $9.00 for the same garment, and also claims that it is impossible for him to make anything lower than $8.50 net. Buyers for retail houses throughout the country are showing a marked preference for

INFANT'S PATENT WRAPPER.

ladies' union suits opening down the front, and some manufacturers who have been running their plants largely on the widely advertised open across line, have been obliged to put in the styles opening down the front in order to keep the business.

The Lumb Knitting Co., Pawtucket, R. I., have brought out a patent wrapper for infants, shown in the illustration. It is double throughout the entire front. There are no buttons or straps. The neck is elastic and fits as desired.

HOSIERY.

There is no evading the fact that the break in the price of heavy cotton underwear is having some effect on heavy cotton hosiery. Of course any concessions that can be made are only in proportion to the weight of the stock, and as this is so small in comparison to the weights on underwear, it is not as far reaching in its effect. Some buyers have even asked manufacturers that they make no changes in their prices for two to three months, and claim that it would be more beneficial to do this than to make the small concessions allowable and thereby plunge the market into an unsettled state. Leading eastern makes of two and one-half pounds 176-needle, hemmed top fleeced goods are being held firmly at $1.00, and the southern product of the same except in certain details of finish is being sold at 97 1/2 cents. Men's five pound bundle half hose vary in prices from 10 to 15 cents a dozen, but buyers find on close inspection that the irregularity is in the qualities as well as in the prices, as the manufacturers have taken every advantage of manipulation of the cheap wool stock from which these goods are made. Two pound 84-needle bundle half hose may be had now at 50 cents, which is a reduction of 2 1/2 cents on the price of last week.

GLOVES.

Domestic manufacturers of knitted gloves report that they are taking large orders for fall, and an inquiry among the jobbers reveals the fact that the surplus of these goods bought from both foreign and domestic manufacturers in 1903 has been consumed, and that during December of last year a real scarcity existed in good numbers at popular prices. The domestic manufacturers have improved considerably in making this class of merchandise during the past two years, and there are those who fail to see why we should be importing hundreds of thousands of dollars of knit gloves from Germany when with proper care and attention this business may be kept at home. It is predicted that the day is not far distant when we shall have this end of the business as we now have the staple hosiery end.

CHEMNITZ REPORT.

The hosiery market is at present very busy and the last steamers leaving the continent carried hundreds of cases from this district, as cargo. The business for spring has devel-

oped during the last three months so well that it will be much larger than in the season just past.

The fine gauge goods which were not called for much are now selling very well again, and even in 42 and 50 gauge goods, manufacturers are well employed for months to come.

The orders for plain black goods are also very satisfactory and exceed those of the last season by far. In these goods the drop in cotton has not had any effect up to now, and as spinners are full with orders until next fall, a reduction is not liable to come.

Trade in lace hose is so large that manufacturers are simply not able to take all the orders importers are offering to them. Large contracts were offered for June-July delivery, but makers did not care to bind themselves so far ahead. But up to April the entire production is sold, and no lace goods can be had before that time. Long delays in deliveries will no doubt be experienced again in these goods. Wages for lace goods have gone up and the low priced numbers which were in the market all last season cannot be had. These goods are mostly bought in black. Tan is not bought so much lately, but white seems to become more popular, as considerable quantities are placed for it. Striped goods are no good in ladies' goods, but small hand embroidered effects are selling very well.

For men's wear, the lace goods have also become popular again, and while last year the stock on hand could not be sold at any price, the production of them is now sold ahead for months.

Business in gloves has not yet developed on fall goods. Ringwoods are supposed to sell well for the coming season, but so far not many large orders are placed, but all importers have taken up large series of samples. Heavyweight goods seem to be in demand. Plaid effects will hardly sell to any extent, but grey and heather mixtures will be good. A good many styles have fleeced cuff or palm. In cashmerette gloves the silk lined are very good. A great many styles with colored linings have been selected by leading import houses, and while last season plain colored linings were the best sellers, check or stripe linings will be shown to make up the assortment of style.

CIRCULAR LATCH NEEDLE MACHINES.

BY LAFAYETTE.

(Continued from January.)

Figs. 13, 14 and 15, being different views of the cam, A, which operates the needles upwards in the needle cylinder, G, other letters are same as referred to in other drawings. The raising cam, A, is attached to cam ring, M 1, by two screws as shown, and therefore

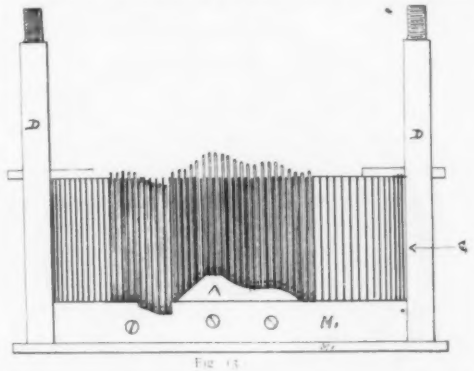


Fig. 13.

Fig. 14.

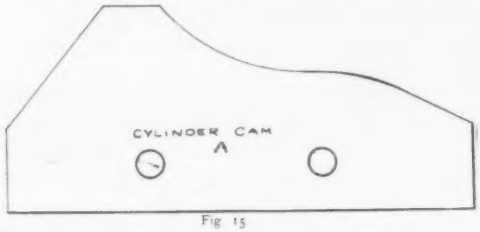


Fig. 15.

revolves with cam segment, I.

Fig. 7 is a plan of I, Fig. 1, and Fig. 12 is an elevation of the same. A, Fig. 12, is the cam which imparts the downward movement of needles in cylinder, G. These cam segments are made in two parts, as shown in Fig. 7. The machine as shown in Fig. 1 has only one feed, therefore only one set of cams is required in one-half or one part as shown in Fig. 12.

If the machine had two feeds, then the other half of cam segment, not shown, would

contain a similar set of cams, but in the machine as illustrated, the other half of cam segment contains no cams whatever, merely a rest for the hub of the needle, A, Fig. 10.

Figs. 7 and 12, C and D, are the parts for operating the loose course on the cylinder needles. This loose course is for the purpose of making it easy to transfer the loops to another needle cylinder, or to a quill ring, and then transfer from it to another machine in order to make a plain foot, heel and toe to a ribbed legged stocking or a ribbed top sock.

C, Figs. 7, and 12, is attached to stitch cam,

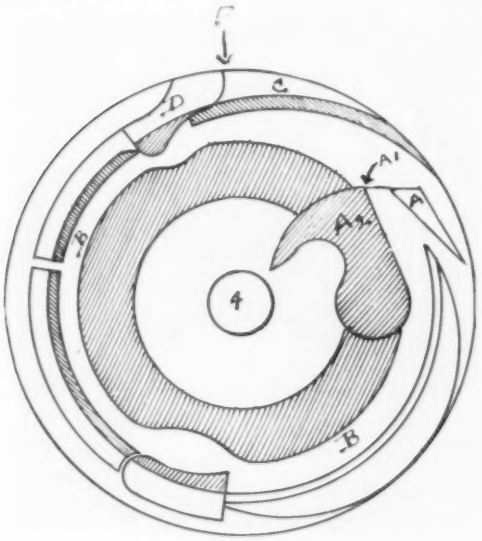


FIG. 16.

A, by means of two screws as shown, and held in a groove cut in the cam segment, I. On the end of the slide, A1, which is movable up and down in said groove, will be seen a spring.

To make a loose course it is necessary to lengthen the stitch, which is done by drawing the needles in cylinder, G, further down, by lowering cam, A. The welt and slack course disc, L, Fig. 1, is raised at the proper time when the cam segments are revolving, and thus come in contact with arm, D, Fig. 7, which projects from the cam segment, I, and is thus thrown on, C, Fig. 7, thus depressing or lowering cam, A. The adjustment for any desired lowering of this cam being done by means of a small screw shown on top of, D, Fig. 12.

Immediately under and attached to, D, Fig. 110, is another arm, which is thrown outwards, by the top part of D being thrown inwards.

On the next revolution of the machine, the welt disc, L, Fig. 1, will come in contact with it, and the arm, D, will be removed from C, the spring below cam, A, bringing the cam up again into its former position.

E, Figs. 7 and 12, are the arms which are also operated in like manner by the welt disc, L, Fig. 1, for the purpose of making a welt by means of the dial cap, F. E, Fig. 12, is the rod which connects the parts, E, to the cams in dial cap, F. The welt is made by cam, A, Fig. 16, drawing back and holding the needles in groove, B, without operating them in and out, while two or more courses are being knit on the cylinder needles alone, when the dial needles are again thrown into action, thus producing what is known as a welt on ribbed knitting. This welt gives a finished edge to the top or ribbed part of the stocking. One or more welts in succession can be made as desired by the adjustment of pattern wheel, O, Fig. 1.

Fig. 16 is a plan of the under side of dial cap, F, Fig. 1. A and A2 are the cam, P, operated on when making the welt. The hubs, A, Fig. 11, of the dial needles travel in groove, B, Fig. 16, and when making welt, cams, A and A2, are in the position as shown in Fig. 16, which shows that by the cap, F, they would all be held back in groove, B, and thus remain out of action.

To put dial needles in action, cam A and A2, Fig. 16, are thrown outwards from the centre by means of rod, E, Fig. 12, and its connections. The needles are thrown out by passing over point, A1, of cam, A2. They are then drawn back again by cam, C, and further drawn inwards by passing over point of cam, D, the operation being repeated on each revolution of the machine.

J, Fig. 1, is the yarn guide, through the hole of which the yarn to the cylinder needles is fed.

The dial needles are thrown outwards by passing over cam, A2, Fig. 16, in a horizontal position and between the cylinder needles, directly under the yarn guide, J. The yarn in being fed to the cylinder or vertical needles

is thus thrown across the dial needles, and in this manner both sets of needles are supplied with yarn through the same guide.

It is attached to dial cap, F, by means of a

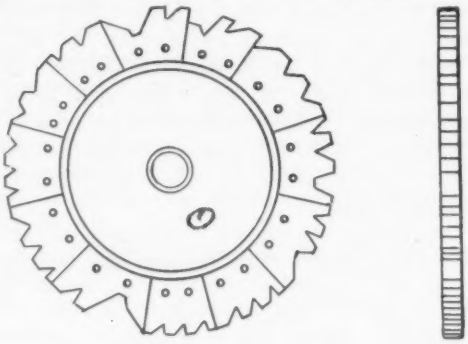


Fig. 19

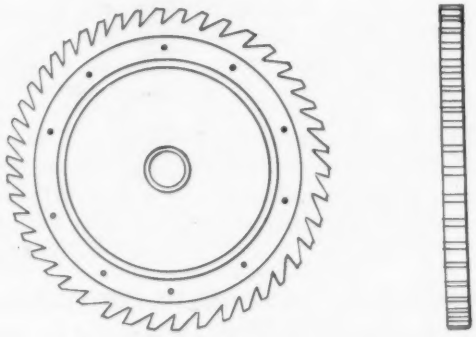


Fig. 18

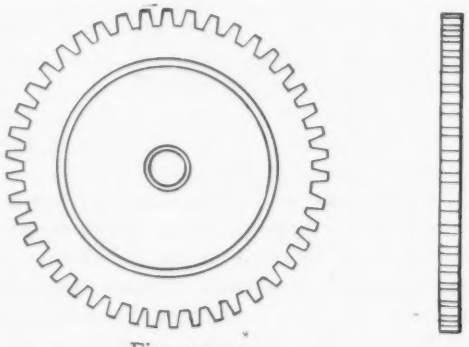


Fig. 17.

screw bolt at the back, and therefore revolves with it, around the cylinder, G, and the dial, Fig. 3.

The yarn guide, J, besides acting as a feeder of the yarn to the needles, is also a shield for the latches of both cylinder and dial needles, hence its shape.

The dial needles begin to come out, and the cylinder needles to rise, just at the right of the yarn guide, the loops on both needles being cast or thrown back of the latches, Figs. 10 and 11, B. This leaves the latches free to close, which from the motion of the machine they would be liable to do, but the under side or edge of yarn guide prevents the latches of the dial needles, and the inner side of it prevents the latches of the cylinder needles from closing, until the yarn is fed to them.

The effect of these latches closing before the yarn is fed to them would be to drop the previous stitches already formed, and which are now respectively at the back of, and below the latches of the needles.

The adjustment of the yarn guide, therefore, must prevent the latches from closing as soon as released after coming out into the dial needles, and also prevent the raising up of the cylinder needles, and also provide that the yarn, in feeding the cylinder needles, shall lie at a point about midway between the pivot of the latch and the hook of the needle.

K, Fig. 1, is the head or base which the upper part of the machine rests on, and is secured to the sides of the frame by two screws on each side. The frame in turn is secured to lower base, K1, with two screw bolts on each side, and the legs, K2, are bolted to it.

L, Fig. 1, is the welt disc, which can turn freely in a socket, L1, in the base, K.

A lever connects with the lower end of the welt disc, and with the pattern wheel, O, and its adjusting wheels, which are enclosed in case, M.

The lever raises the welt disc, L, and also permits of its being lowered. When raised it comes in contact and operates levers, E, Figs. 7 and 12, for producing the welt and slack course as already described.

M, Fig. 1, is merely an outer case or covering for the ratchet and gear wheels, Figs. 17 and 18, to which are attached pattern wheel, O, Figs. 1 and 19.

N, Fig. 1, is a handle attached to these wheels, and permits of their being turned around to any given starting point when machine is not in motion.

O, Fig. 1, is the pattern wheel for regulat-

ing the place in the knitting where the welt and slack course occurs. The deep indentation, as shown in view, Fig. 19, is where the welt disc lever drops, thus permitting it to be lowered and out of action until raised again by the action of the pattern wheel.

P, Fig. 1, is a fabric guide and shaft. At the back of this is a wheel, not shown, which is covered with card clothing. The points of the wire engage with the fabric at the back, while the guide, P, holds the fabric at the front. The wheel at the back is thus revolved by the downward pull of the fabric through rollers, X, Fig. 1. At the other end of this

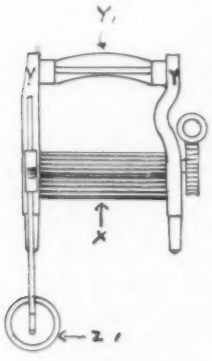


FIG. 20.

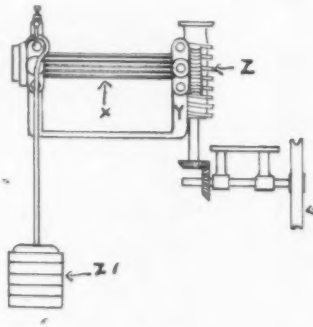


FIG. 21.

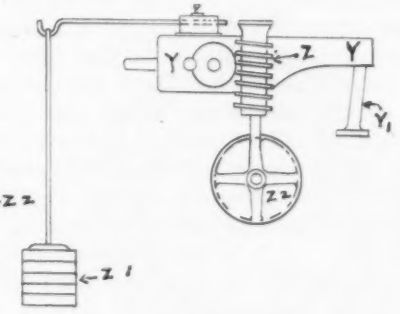


FIG. 22.

turning machine by hand, when necessary to examine its working, or when fixing it.

S1, Fig. 1, is the driving pulley and S the loose pulley of the machine. T, Fig. 1, is the belt shipper for transferring the belt from tight to loose pulley and vice versa. U, Fig. 1, is the bracket which supports one end of the driving shaft, W, the other end being supported by a socket in frame of machine.

V, Fig. 1, is the catch which holds the belt shipper, T, in place, when belt is shifted to tight pulley, S1.

The spring, as shown connected to belt shipper, T, causes it to transfer the belt to the loose pulley, S, when it is released by the catch, V.

W, Fig. 1, is the driving shaft on which are pulleys, S and S1, hand wheel, R, bevel gear, 5, and driving pulley for take-up.

X, Y, Z, Z1 and Z2, Fig. 1, comprise the take-up mechanism. Different views of the take-up are shown in Figs. 20, 21 and 22.

X are the take-up rollers, Y are the brackets and Y1 the bracket stand, which is fastened to base K1, Fig. 1, the brackets, Y, being attached to a shaft running through the stand, Y1, thus permitting the whole of the take-up, except the stand, to move up and down. Z is the worm wheel which turns the take-up rollers, X.

The worm, Z, is revolved by two bevel gears as shown in Fig. 21, one of which is attached to shaft and pulley, Z2, this being driven by a belt from pulley on driving shaft, W, as shown on Fig. 1.

wheel and shaft is a gear, which connects or meshes into the gear, Fig. 17, both being enclosed in case, M, Fig 1.

In this manner motion is communicated to the gear, Fig. 17, ratchet wheel, Fig. 18, and pattern wheel, O, Fig. 19, all of which are dependent upon the fabric passing through the rollers, X.

Q, Fig. 1, is a chain attached to framework of take-up, Y, and to the stop motion catch, V.

The weights, Z, attached to take-up, exercise a pull on the fabric as it is being knit.

Should the fabric become slack or come away entirely from the needles, the weights would immediately lower the take-up, and thus pull on the chain, which would release catch, V, and transfer the driving belt to the loose pulley, S, by the belt shipper, T, automatically stopping the machine.

R, Fig. 1, is the hand wheel attached to driving shaft, W, and is for the purpose of

Z1 are the weights attached to one of the brackets, Y, of the take-up.

When the machine is running the pulley on driving shaft, W, with belt drives pulley, Z2. This revolves worm, Z, which in turn revolves take-up rollers, X.

If this results in turning rollers, X, faster than the cloth is being knit and supplied to them, it will cause the lifting of the weights and whole take-up, including the pulley, Z2. This results in the slacking of the driving belt on pulley, Z2, which will then cease to revolve.

After more cloth is knit, the pulling down of the weights will lower the take-up again and cause the tightening of the belt, and the starting of the take-up rollers, X. This shows that the automatic working of the take-up depends upon the cloth coming down as it is knit, the pull upon the cloth being adjusted more or less according to the number of weights on Z1.

The English yard and pound are the exclusive standards for all branches of the textile industry in English speaking countries, and are the chief textile standards on the Continent of Europe.

A STRIPING ATTACHMENT FOR KNITTING MACHINES.

An improved device for producing stripe effects in circular knit goods has recently been patented in this country. It is claimed that it can be built at less cost than that of stripers now in use, while it is more effective in operation.

Fig. 1 is a side elevation of the improved attachment with the yarn-dropper, yarn-cutter, and holder removed, the attachment being shown in connection with a portion of the needle-cylinder, which is shown in section. Fig. 2 is side view.

In machines of this character it is necessary to cut and to hold the yarn which is carried out of the stitch-wheel until it is desired to have the yarn again enter the stitch-wheel. This is accomplished in the new device by a vertically-arranged stationary cutter, C, and a movable cutter, A'. The movable cutter is journaled upon a suitable pivotal arm and secured rigidly to the cutter-blade is a rod, to the outer end of which is attached a spring, which nominally holds the cutter closed. The cutter is opened by the lever, 14, a link having one end connected to the lever and its opposite end connected to a crank-arm, which is carried by an oscillating rod, the outer end of this rod carrying a crank-arm, which in turn is provided with a wheel or truck, which is adapted to be engaged by a cam at the under side of the needle-cylinder.

A spring normally holds the parts in the position shown in dotted lines, Fig. 2, and the

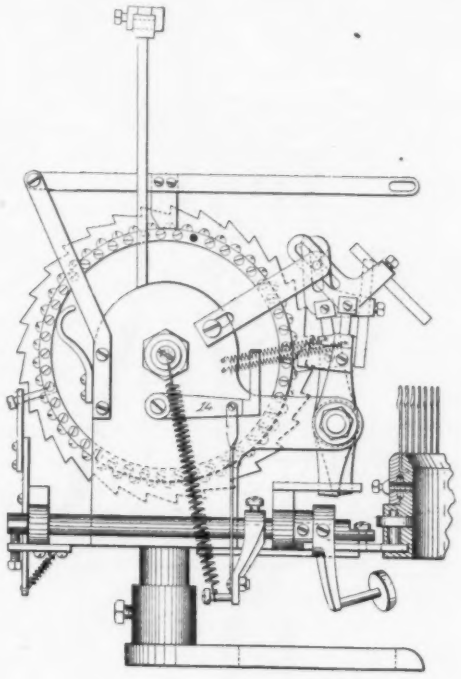


FIG. 1.

cam serves to carry the parts in the position shown in solid lines. When moved in the position shown in solid lines, an arm, rigidly connected with a bar, is caught and held by a latch-lever. When the parts are held in this position, the upper end of the lever engages the under side of the rod and raises it against the tension of the spring, and hence holds the cutter-blade in an open position. The upper end of the latch-lever is provided with a shoulder, adapted to be engaged by

a long screw projecting from the periphery of the pattern-wheel. When so engaged, the latch-lever is moved into the position shown in dotted lines, Fig. 2, and thus releases the arm, which permits the spring to oscillate the rod and carry its parts into position. When the cam engages the truck, the lever is depressed, which permits the spring to draw the rod downward and to close the cutter-blade. When the yarn is cut, it has a tendency to drop, and hence a suitable holder must be provided, and for the purpose of making the cutter-blade coact with a station-

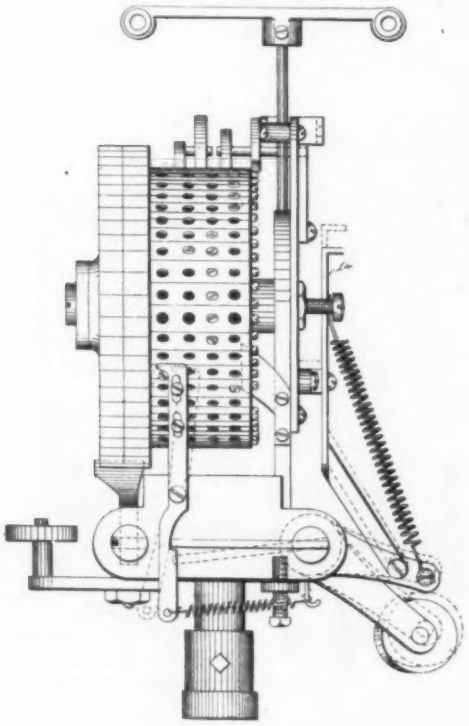


FIG. 2.

ary member and effect a positive holding of the yarn, the adjacent face of the cutter-blade is provided with a felt pad, which serves to grasp the cut end of the yarn and to hold it firmly until it is released by the opening of the cutter-blade.

The parts being in the position indicated in Fig. 1, the yarn carried by one yarn-finger is entered into the stitch-wheel, while the yarn carried by the other finger is thrown out of the stitch-wheel. The yarn carried by the first finger continues to enter the stitch-wheel, and the rotation of the needle-cylinder causes the cam to engage the truck, which moves the pawl just sufficiently to engage a tooth of the pattern-wheel. The continued rotation of the needle-cylinder brings the cam-surface into engagement with the truck, and moves the lever farther back, and hence moves the pawl farther, and begins the rotation of the pattern-wheel sufficiently to cause the screws of the pattern-wheel which coact with the second yarn-finger to disengage the cam and permit its lever to be drawn inward by its spring, and hence throws the yarn into action and makes the joining of the yarn into the fabric.

As the needle-cylinder continues to revolve the truck is brought into engagement with the cam-surface, which revolves the pattern-wheel still farther and brings the screw-pin in contact with the upper end of the pivoted lever and moves it into the position shown in dotted lines, Fig. 2, against the tension of the spring, and releases the arm, which causes the cutter-blade to be opened by the upward movement of the lever 14 in the manner previously described. This movement of the pattern-wheel at the same time causes the screws coacting with the lever, with which the yarn-finger is connected, to engage the cam of the lever, thus forcing the lever outward and raising the first yarn-finger and throwing its yarn out of action; the yarn is carried in the manner previously described between the cutters. The continued rotation of the needle-cylinder causes the cam to engage the truck, which draws the lever downward, as before explained, and the spring, connected to the rod, closes the cutter-blade, cutting the yarn and also positively holding it between the padded surfaces of the cutter-blade and the adjacent member. This operation is repeated at each revolution of the needle-cylinder, or it may be repeated several times during the operation of the cylinder by providing the needle-cylinder with several sets of the cams, and correspondingly arranging the screws carried by the pattern-wheel and providing a suitable number of pins, this being merely a duplication of the operations.

UNDERWEAR FOR THE WESTERN TRADE.

BY WABASH.

There is a great demand, which is still growing, for good woolen underwear for the Western market; an article which combines a soft, lofty, fluffy feeling with a certain solidity and weight.

There are two very distinct styles of goods made in the Eastern mills; distinct both in the grade of wool used in the mix, and in the finish of the cloth. One of these styles, which is smooth and soft to the touch, with considerable elasticity, is the worsted finished article; the other, which is soft, woolly, fluffy, and has considerable nap on the face, is called the wool finished article. Both of these styles, however, fall short of Western requirements, which are solidity and softness with a moderate amount of nap combined.

I do not mean to state that these two styles of goods mentioned do not sell in the West, for they do; but that there is a demand far in excess of the supply for the soft, fluffy, fleecy and solid feeling goods I speak of. The manufacturer who succeeds in making such an article will have no trouble in selling his goods, nor will he have to lay awake nights wondering whether he will be able to pay all expenses at the end of the year, as these goods command a much better price than the others, while the difference in the cost is not large. The important factor is knowing how to get the effect required.

The time was when a line 14 or 12 gauge goods, properly made and nicely finished, would fill the bill, but that is all changed now. The tendency is toward a moderately fine appearing piece of goods with the other requirements spoken of. Sixteen gauge is the most suitable. On this gauge underwear weighing from 12 1/2 pounds to 14 pounds per dozen can be made with very little change required. There is a still greater range possible on this machine with a skilful boss knitter, but the best results can always be obtained by confining the work to the gauge of machine most suitable to the weight and appearance of the goods required.

While some merchants are satisfied with goods weighing about 12 1/2 lbs. per dozen, the majority want them over 13 lbs. per dozen, size 40 shirts being taken as the average. To illustrate the feeling in the West on this matter, I will relate an incident that happened a short time ago in one of the largest wholesale and retail dry goods houses in Chicago: Several salesmen and several buyers happened to meet there. While discussing the merits of the samples shown and admitting their good points, the buyers were apparently not satisfied. One of them finally spoke up and said:

"Mr. Blank, while your goods look very nice and might sell if they were up to weight, still I am a little doubtful. I can, however, show you something that I know will sell."

He then produced a natural grey sample shirt, size 40, which proved to be the style I speak of. When weighed, it was 13 1/4 lbs. per dozen. The buyers were all of one opinion too. The only trouble is to get the goods. The salesman, of course, again pointed out the good features of his goods, but to no purpose, as on being weighed they proved to be but 12 1/4 lbs. per dozen. The buyer then took the stand that the extra weight and solidity carried the idea of extra wearing qualities and general worth.

The salesman next pointed out the difference in price. His goods were $12.00 per dozen, the others $13.50 per dozen.

"Well," said the buyer, "if the public is willing to pay the difference, why I am satisfied to pay it too."

The controversy finally ended with the buyers still undecided and willing to wait for heavier goods. All of this goes to prove the truth of what I say: That nothing is too good for the Western man.

One other thing: The people seem to be educated to the fact that soft, spongy, fluffy goods can be and are made with a large per cent. of shoddy; and while a small per cent. of good shoddy may be all right in some styles, he will be a salesman of extraordinary ability who can convince the Western man that it is good enough for him.

It is estimated that the manufacturing cost of cotton cloth per yard in New England is 2.89 cents.

Oil Spots on Knit Goods.

Editor Textile World Record:

Can you give us some method of taking oil spots out of worsted knit goods? We often have to send large articles to the dye house to be cleaned when they have only a small oil spot or streak. We have experimented with chemicals, but the results are not satisfactory. Oregon (502).

On page 145, in the September, 1904, issue of the Textile World Record, and on page 136 of the October issue Oregon will find articles dealing with this subject, which should be of help to him.

Waste in Knitting.

Editor Textile World Record:

About what is the percentage of loss or waste sustained by the knitter over and above the 2 per cent. cone allowance made by the yarn manufacturer?

In other words, what is the full percentage of loss including cones, packing paper, lint and ravelings?

Investigator (480).

In this question the inquirer evidently thinks that the 2 per cent. cone allowance by the yarn manufacturer is an allowance to cover part of the waste made in knitting direct from yarn wound on cones. Such is not the case, the 2 per cent. cone allowance should not be taken into the consideration in the waste account.

The yarn manufacturer in supplying his customers with yarn wound on cones, charges extra for the winding, and allows 2 per cent. tare to cover the weight of the cone, and packing paper. That is to say in weighing the yarn on the cones the gross weight of the case is taken, which includes paper cones, the tissue paper and the packing paper of the case. The tare or weight of the case is deducted and then 2 per cent. of the balance of the weight is taken off to cover the actual weight of the cones and packing paper, thus leaving the net weight of the yarn, which is all the customer thus pays for.

Yarn manufacturers have carefully weighed a certain number of cones and paper, and have found that it amounts to 2 per cent. of the whole, and it has therefore become a standard allowance for the tare of yarn wound on cones over and above the tare of the case.

The loss of waste in knitting, and in lint and raveling, is a separate item. It is in addition to the 2 per cent. cone allowance, which is not a cost factor at all.

Some time since it was published in the Textile World that the waste from hosiery was one ounce per dozen on one pound goods, or one ounce to a pound, and that this waste included all processes up to dyeing. This would be equal to 6 1/4 per cent.

Some manufacturers take the actual cost of the material and making outside fixed expenses and then add 5 per cent. to this cost for waste.

Others allow 7 per cent. and others even 10 per cent. for waste, but an allowance of 5 to 7 per cent. will generally be ample to cover the actual loss. Noel Howe.

Recent Knitting Patents.

KNITTING MACHINE Needle. 773,722. John C. Egly, Philadelphia, Pa., assignor to Keystone Knitting Mfg. Co.

This is a knitting-machine needle having a pivotal latch which is adapted to be seated in a recess in the end of the hook or head of the needle and form an unbroken surface with said hook or head, thus avoiding sharp or cutting edges on the hook and latch when the latter is closed and on the latch when the same is open and the latch is laterally sustained in a firm and reliable manner on said hook.

Figs. 1 and 2 represent side elevations of a knitting-machine needle embodying this invention. Figs. 3 and 4 represent side elevations of portions of the same, on an enlarged scale, the latch being shown in different positions. Fig. 5 represents a side elevation of the latch detached and on an enlarged scale. Fig. 6 represents a vertical section of the upper portion of the needle, the latch being open.

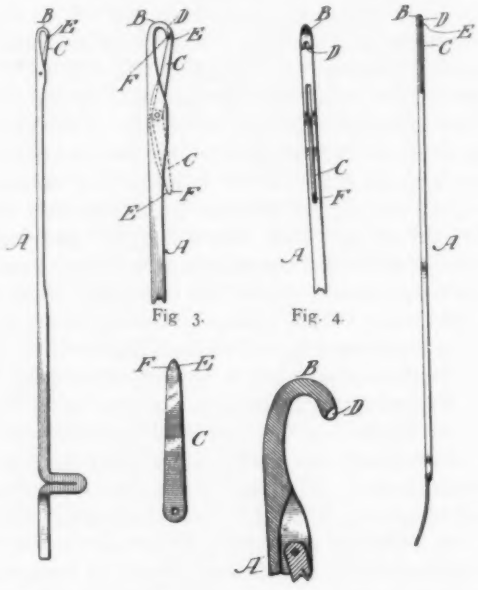
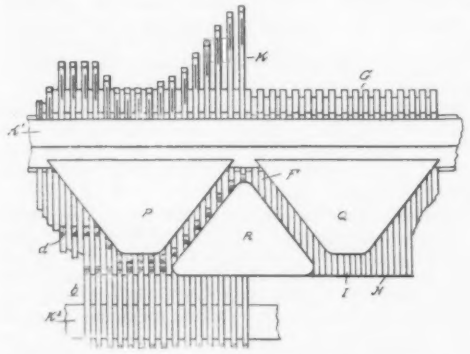


Fig. 1 Fig. 5. Fig. 6. Fig. 2.

Fig. 3. Fig. 4.

KNITTING MACHINE. 773,477. Chesterfield F. Cole, Lansing, Mich., assignor to the Quincy Knitting Co., Three Rivers, Mich.

This invention relates to knitting-machines of the type generally known as "straight-knitting" machines, and consists, primarily, in a novel construction of needle-bed adapted to receive the needles and to permit of their angular adjustment, whereby they may be withdrawn from or thrown into operative relation with the needle-operating cams.



The invention further consists in a new and simple construction of needle-holder, in the formation of the adjusting and locking mechanism for the holder to retain the needles in different positions of adjustment, and, still further, in the peculiar arrangement and combination of other parts of the machine.

KNITTING MACHINE. Circular. 779,423. Harry A. Houseman, Philadelphia, Pa., assignor to Standard Machine Co., Philadelphia, Pa.

KNITTING MACHINE Stop Motion. 778,538. Franklin S. Forry, Myerstown, Pa.

KNITTING MACHINE. Straight. 780,394. Hugo L. Weigert, Thum, Germany.

Rotary Knit Goods Slitter.

Samuel M. Langston, 9th above Market St., Camden, N. J., is busy filling orders for his new rotary slitter and rewinder for cutting knit fabrics into narrow strips and rewinding them into rolls for elastic seams in jean underwear. He is also building an adjustable chopper which cuts fabrics into lengths at a rate of 160 per minute.

KNITTING MILL NEWS.

New Mills.

*California, Los Angeles. Work is expected to begin about Feb. 15th on erection of new building for the Pacific Knitting Mills Mfg. Co., recently reported incorporated with capital stock of $30,000. They will make men's balbriggan underwear. Charles C. Hurd is president of the company and H. M. Hurd treasurer. About 60 people will be employed.

Massachusetts, Millbury. The Worcester Knitting Mills have been put in operation making men's cotton, worsted and wool ribbed goods. Company is capitalized at $200,000, with William Hurd as president and treasurer of the company, and Frederick H. Dennis superintendent. Plant is equipped with 6 sets cards, 60 knitting and 65 sewing machines and dye house. Goods are sold through Barnes & McGoey, New York. The above company succeeds to the business formerly run as the Koted Silk Underwear Co.

*New Hampshire, Tilton. The hosiery plant to be started up in the Copp factory will be operated by Frank P. Stewart of Laconia. Hosiery will be made.

New Jersey, Jersey City. Katz Bros., 44 Coles Street, have recently started a plant for manufacturing ladies' blouses, etc. This plant is equipped with 3 knitting machines and one sewing machine. Will increase plant as business warrants.

New York, Brooklyn. The Ralph Knitting Mills, 101 Ralph St., is one of the new concerns here manufacturing sweaters and fancy knit goods which has had success during the season just closed. They operate 15 knitters and two sewing machines, using both hand and gas as the motive power. W. B. Wilson is the manager and superintendent, and buys woolen, worsted and merino yarns. The goods are sold direct.

New York, Brooklyn. The Villa, Stearns Co., 171 Wallabout St., is a new concern which is now occupying quarters formerly used by the Klotz Throwing Co. They deal in raw, and manufacture thrown and dyed silk and insulating silks, and report having as much business on hand as they can attend to. The superintendent is H. H. Henderson, who is also the buyer.

New York, Brooklyn. B. Shapiro is about to start up a plant for the manufacture of woolen socks and stockings, commencing business with 6 machines which he is about to order. His address, until suitable quarters are obtained, will be at 718 Flushing Ave.

*New York, Greenwich. The Greenwich Knitting Company has been incorporated with capital stock of $100,000. Merritt C. Rowe, Frank F. Fisher and John S. Cronin, the latter of Troy, are interested.

*New York, Little Falls. The Rex Knitting Co. has been incorporated to operate the plant formerly run by the Titus Sheard Co. They expect to begin operations about March 1st and will employ about 300 people. Frank Senior, formerly with the Titus Sheard Co., will be superintendent for the new company.

New York, New York. A new plant has been started up at 84 Avenue D, near 7th Street, by W. Levin, manufacturing ladies', men's and boys' sweaters, jackets and stockings. Operates 6 knitting machines and one sewing machine. Buys wool and worsted yarns.

New York, New York. The Metropolitan Knitting Mills have been incorporated with capital stock at $10,000. J. J. Lippman, Alexander Silverberg (New York) and Barnett Friedman (Yonkers) are interested.

Enlargements and Improvements.

*Alabama, Anniston. The Anniston Knitting Mills advise us that report of addition to the mill is premature.

New York, Amsterdam. The Blood Knitting Company is enlarging the rib goods department, increasing product to 200 dozen per day.

New York, Brooklyn. L. Oboler, who recently started the Lion Knitting Mill, 155-57 Stagg St., has placed an order for 10 new machines to be received Feb. 1st. He manufactures sweaters, selling direct.

*New York, Hamilton. The branch mill of the Oneida Hosiery Company, which will be put in operation March 1st, will be equipped with 50 knitting machines and 3 sewing machines, for making seamless hosiery. The company's main office is at Oneida.

New York, Kinderhook. Additional machinery, comprising about 5 power and 40 hand machines, is to be installed in the Elk Knitting Mill. It is expected that the reconstructed plant will be in operation by Feb. 1st. The packing and inspecting room will probably be located in another building owing to limited space in present building.

New York, New York. Jos. L. Howe & Son, operating the Clayton Knitting Mills, 257 Bowery, with 17 knitting and 5 sewing machines, on blouses, norfolks, vests, etc., have ordered 10 more machines, which they expect to have in operation in a short time.

New York, New York. The Manhattan Knitting Works, on Lispenard Street, have been consolidated with the Manhattan Knitting Mills at 68-70 Elm Street, where machinery has been removed. This makes a total of 42 spring, 12 latch and 11 sewing machines in operation, on wool and worsted sweaters and hosiery. Goods are sold direct.

Mills Starting Up.

*Mississippi, Columbus. Operations have been started in the Columbus Underwear Company's new plant. Plant has capacity of 300 dozen suits per day.

Pennsylvania, Bath. Operations have begun in D. J. Odenwelder's new hosiery mill.

Pennsylvania, Reading. Operations have been resumed by the Consolidated Knitting Mills, which have been closed for a few days.

Facts and Gossip.

Alabama, Athens. The Athens Knitting Mill is a new company in which H. Smith is actively interested. It is stated that the buildings formerly occupied by the Limestone Hosiery Mills have been leased for the purpose and will be equipped with machinery for making high class hosiery.

*Alabama, Centerville. The H. C. and W. B. Reynolds Co. advises us that they contemplate establishing a plant for manufacture of ladies' vests. This projected plant was mentioned as a hosiery mill in a recent issue with the Centerville Warehouse Co. as interested. The company also proposes putting in a rope factory and are getting catalogues, etc., on equipment.

Pennsylvania, Mount Holly. It is reported that parties from Orwigsburg will start a hosiery mill here in building owned by J. H. Wolf, of Carlisle, if motive power can be obtained from the trolley company.

Pennsylvania, Norristown. The Keystone Knitting Mills Co., which was formerly located on Oak Street, is now operating the old Yost Mill at 26 E. Marshall Street on children's, misses' and men's hose and half hose of cotton with 125 knitters and 10 loopers. This plant, which is run under the supervision of Chas. Templeton, the assignee, is reported to be organized within a short time. W. J. Clark is the superintendent. The goods are sold direct. They report business as extremely good.

Pennsylvania, Norristown. The Penn Knitting Co., with a capital of $25,000, is doing a good business on their women's seamless and ribbed and misses' ribbed underwear operating 60 machines. They sell direct.

Pennsylvania, Norristown. Robert E. Boyle, at one time a member of the firm of Ruth & Boyle, manufacturers of knitting machinery, has taken over and is operating the DeKalb Knitting Mills on children's hose and men's half hose of lisle on 40 knitters. Mr. Boyle reports that business is good, he has more orders than he can fill for immediate delivery and futures coming in. He sells direct; buys 36 to 50 2-ply yarns.

Pennsylvania, Reading. The Empire Hosiery Mills and the Reading Spinning Co. have been merged and in the future they will trade under the name of the Consolidated Knitting and Spinning Mills.

*Pennsylvania, Richland. The Richland Knitting Company's mill has been sold to A. C. Haak. Mr. Haak will continue operating the mill to its full capacity.

Tennessee, Knoxville. It is reported that Philadelphia parties are interested in locating a large knitting mill at this place and have been conferring with H. M. Branson, secretary of the Chamber of Commerce, relative to suitable location.

Virginia, Berkley. The Chesapeake and Elizabeth Knitting Mills have been leased by William Sloane & Co., who will continue to operate both mills. Mr. Sloane was formerly president of Foster, Black & Co., formerly proprietors. W. B. Dougherty has been elected president of the Chesapeake Mill.

Personals.

George Flannagan has been appointed superintendent of the Himes Underwear Co., Cohoes, N. Y. He comes from New Britain, Conn.

F. W. Perkins, treasurer of the Samuel Fitch Manufacturing Co., Providence, R. I., it is reported, will sever his connection with that company.

Eugene Long, carder at the Bristol Mfg. Co., Plainville, Conn., has resigned and accepted a position as boss carder at Stafford Springs.

Frank Reichenbach, lately with the Grosser Knitting Machine Co., is now with Otto Walther, importer of German knitting machines, 591 Bourse, Philadelphia, Pa.

(For additional Knitting Mill News see Mill News Dept.)

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices, and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

We invite machine builders and others to send us such information for this department.

Float Thread Shearing Machines. The Curtis & Marble Machine Co. have recently made several improvements in their machines for cutting and shearing float threads from spot effect fabrics. A description of the machines appears in this issue.

New Draper Loom. The Draper Co., Hopedale, Mass., are bringing out their new E Model loom with improved harness motion, referred to in another part of this issue.

Cloth Cutting Machinery. James A. Cameron, Brooklyn, N. Y., has recently completed for the United States Government and for several private concerns a cloth splitting machine adapted to cut buntings and other materials from which flags are made into strips precisely down the line of the thread, this work having formerly to be done by hand with shears. The machine cuts at one operation any number of strips desired, and after being cut winds them into rolls. The machine will cut from 25 to 30 yards of cloth per minute. This firm has also built a machine for cutting broad webs of silk into narrower widths down the line of a doup. These machines are claimed to produce much better results than was possible with the old hand method.

Faller Motion. Societe Anonyme Verviétoise, Verviers, Belgium. A faller motion with special device for preventing the breaking of the yarn when the fallers rebound.

Attachment for Ring Frames. Gustav Schmidt, Colmar, Germany. A device for ring spinning and twisting frames to prevent double ends.

Sizing Machine for Batting. Robert Kreiss, Bielitz, Austria, has recently brought out a machine for sizing and pressing batting in one operation.

Grinder for Calenders. Dronsfield Bros., Oldham, Eng., have placed on the market a traverse grinder for grinding calender rolls.

Yarn Tester. Dronsfield Bros., Oldham, has recently introduced a device for testing the size of yarn, of which a number of ends have been wound on a spool. As the yarn is measured each end is run into a separate compartment, and when the desired length is obtained, is weighed and the size thus determined.

Shuttle Box. Oberholzer & Busch, Zurich, Switzerland. An attachment for shuttle boxes which, it is claimed, prevents the rebound of the shuttle, holds the shuttle firmly in place and prevents wear on the picker. It is said to be an important improvement, particularly on silk looms.

Dyeing Machine. August Riedel, Neumunster, Germany, has recently placed on the market an improved dyeing machine for textile materials. The improvement consists in the method of heating the liquor and the handling of the material in the bath.

Warp Printing Machine. Otto Hallensleben, Luzerne, Switzerland. A machine for printing, steaming, and washing warps, which is claimed to possess several new and important features that have been thoroughly tested in European mills.

Yarn Dyeing Machine. Edouard Esser & Co., Goerlitz, Germany. A machine for dyeing, bleaching and otherwise treating slubbing and roving on spools.

Dyeing Machine. Otto Venter, Chemnitz, Germany. A dyeing machine in which the liquor is forced alternately in opposite directions through the material by alternating a vacuum with air pressure.

FLOAT THREAD SHEARING MACHINES.

For cutting and removing the floating portion of the yarn used for spot effects in fancy goods, special shearing machines are required. Our illustrations show two machines of this character built by the Curtis and Marble Machine Co., Worcester, Mass. Fig. 1 is a machine designed especially for cutting float or bridge threads on fancy spot cotton, silk and other goods which are woven with wooden wings is provided for cleaning the back of the goods.

A valuable feature for fancy spot goods is the change-speed device by which the speed of the cloth may be quickly changed independent of the other parts of the machine, according to the pattern and the amount of material which are cut off. This device enables each particular style to be sheared at the highest practical speed, thus increasing the capacity of the machine.

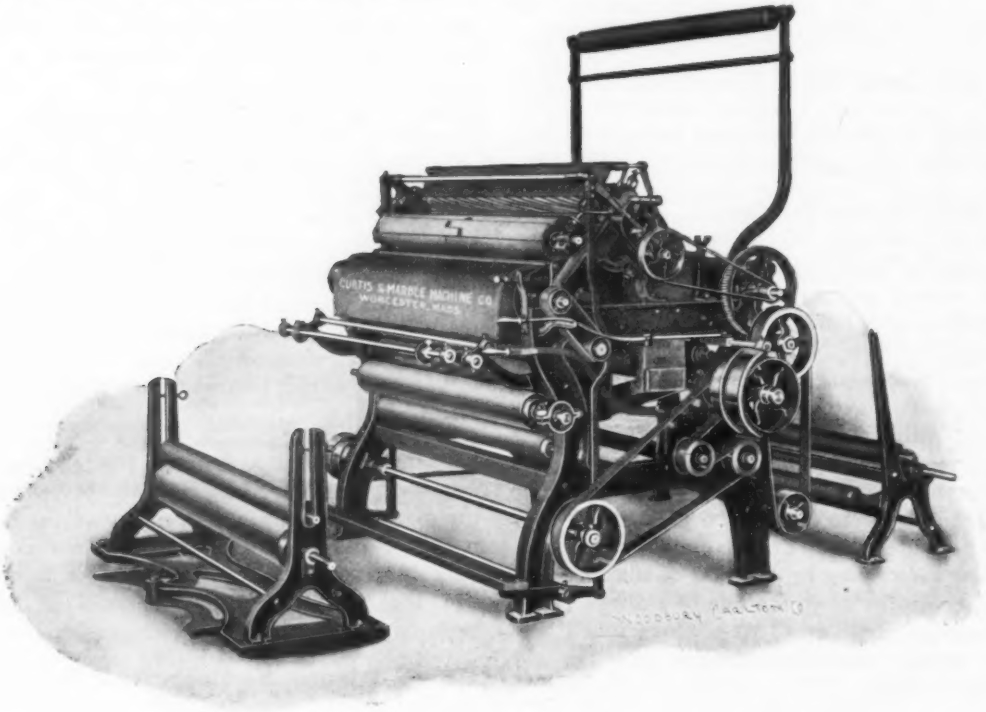


FIG. 1.

either filling, warp, or lappet spots. These shears have various attachments to facilitate the handling of different styles and patterns, and have proved the most complete and convenient machines anywhere built for this class of work. On the front of the machine is a brush which acts on the face of the goods for brushing up the fibres so that the shear-blades may trim them off. This brush may be run in either direction as desired, and means are provided for throwing the cloth entirely out of contact with the brush when its use is not required. A beater with

There is also a lifting device to raise the revolver by means of a foot-treadle when the seams go through. This device is very convenient and is appreciated by all shear-tenders, as it leaves both hands free for straightening out and guiding the cloth free from wrinkles, especially at the seams.

A spreader-roll is used in many cases in front of the cloth-rest to hold the goods out in width and remove wrinkles. The spreader-roll is made with brass trucks and slides inside, and as the roll is turned by the cloth in passing around it, the slats are drawn out-

ward from the centre toward each end. It is of advantage on almost all goods, and will be found especially useful on light goods which tend to draw together, or goods with open-work stripes.

The material cut off by the blades may be held in an open flock-box and removed from time to time as it accumulates, or the machine may be equipped with an enclosed flock-box and bonnet back of the revolver, with inlet and outlet pipes ready for connections to a blower and an exhauster for sucking off the material as fast as it is cut off. As a large amount of material is cut off on many fancy spot goods, this is a very desirable attachment, and keeps the machine and the room much cleaner than if the flocks are allowed to accumulate. Where an exhauster and blower are used, a current of air from the blower enters at each side of the machine, just back of the revolver, to sweep the flocks away from the back side of the blades toward the centre, whence they are sucked off through a pipe by the exhauster, and are then discharged into a lint-room or dust-collector which may be located in any convenient part of the mill. The discharge-pipe to connect from the machine to the exhauster, may run either up or down according to the location of the exhauster and blower, which are often placed on a platform underneath or overhead, wherever it is most convenient for parties to drive them.

For shearing spot lappet goods, a swivel-frame is used as shown on the above cut, in order to give a "skewing effect" to the goods as they pass through the shear. The "skewing effect" is required for throwing up the bridge threads as they run diagonally from spot to spot. This swivel-frame is not required for ordinary warp or filling spots.

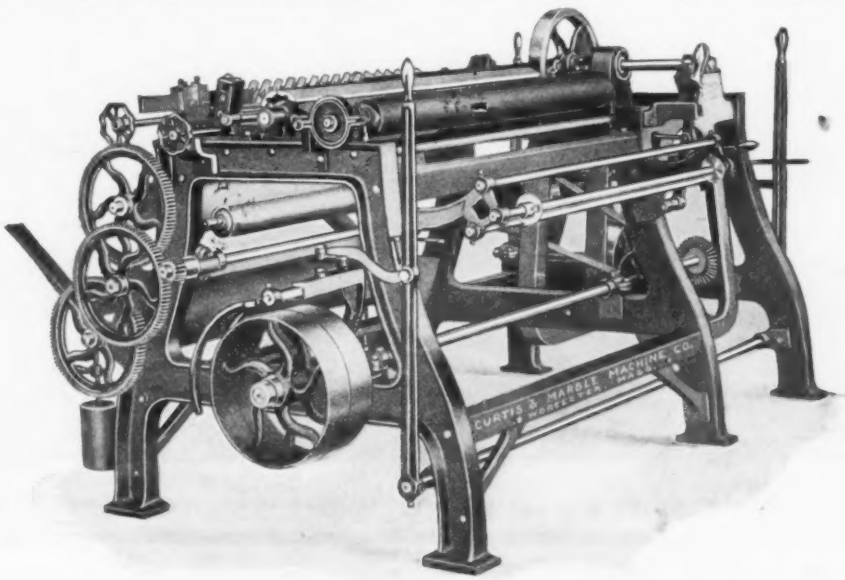


FIG. 2.

As most goods are handled on rolls, a rolling-head is generally placed back of the machine, as shown in cut. In this way the goods are kept cleaner and smoother, and the direction of the shearing is reversed at each run through the machine. If desired, the machine can be arranged with folding attachment and cloth scray underneath to run the goods endless.

On filling and lappet spot goods, all the work of cutting off the float or bridge threads is done on the shearing machine. On warp spots, the bridge threads must be cut open before going to the shear. The other machine, shown at Fig. 2, is built for cutting

open the bridge threads on fancy spot goods woven with warp floats preparatory to shearing. After being cut in this way the projecting threads are sheared off close on the the float thread shearing machines. The cutting is done by a series of knives attached to a bar which vibrates rapidly across the goods as they pass through. These knives are set so as to cut each way from the centre toward the selvages, and are made with a rounding point so that they may pass under and cut the loop threads without cutting the goods themselves. The macnine is provided with the necessary tension bars, guide collars and friction roll for drawing the goods out smooth and even, and guiding them straight into the machine.

Before reaching the knives the goods pass over a spreader-roll, which removes wrinkles or creases, and holds the goods out in width. At each side of the knives are nip rolls which hold the goods firmly during the cutting process; hand wheels are attached to the bottom nip rolls for convenience in threading in the cloth. The rear set of nip rolls are made adjustable so as to bring the cloth closer to or farther away from the knives, and a hand lever is provided to throw the goods entirely out of the way of the knives when seams go through. There is a stop and start motion governed by a friction clutch so that the cloth may be readily stopped and started in its travel through the machine while the other parts are in motion. A change-speed device is also provided by which the speed of the cloth is quickly changed, according to the pattern which is being cut. Patterns in which there are long float threads between the spots may be cut at a faster speed than fine patterns where the bridge threads are comparatively short. After passing through the machine the goods are rolled up on brackets at the rear, ready for the shear.

This loop cutting machine is strongly built and has an extension frame at one end, which holds many of the working parts and gives increased stiffness to stand the working strain from side to side.

The world's total cotton crop for 1903 was 16,104,000 bales, of which the United States furnished 11,415,000 bales.

THE PREVENTION OF STEAM IN SLASHER ROOMS.

The prevention of steam in slasher rooms is one of the important problems presented in the management of every cotton mill in which slashers are in use. Attempts are often made to secure the desired end by natural ventilation but with uncertain results. For a positive solution of the problem it is desirable that there should be a clear understanding of the conditions.

The source of the visible moisture in a slasher room is obviously the water which forms the principal ingredient of the size and which is vaporized by the intense heat of the drying cylinders as the yarn passes over them.

The following table gives data collected from the slasher rooms of a number of mills:

Mill.	Average temperature in Slasher Room.	Pounds of water in size used per Slasher per hr	Remarks.
A	89	185	Heavy work.
B	89	200	Light work.
C	93	200	45 fifty yard cuts of No. 28 yarn per hour.
D	80	250	47 fifty yard cuts of No. 30 yarn per hour.
E	75	160	
F	90	330	
G	90	185	
H	80	275	
I	70	155	
Average	84	215.5	

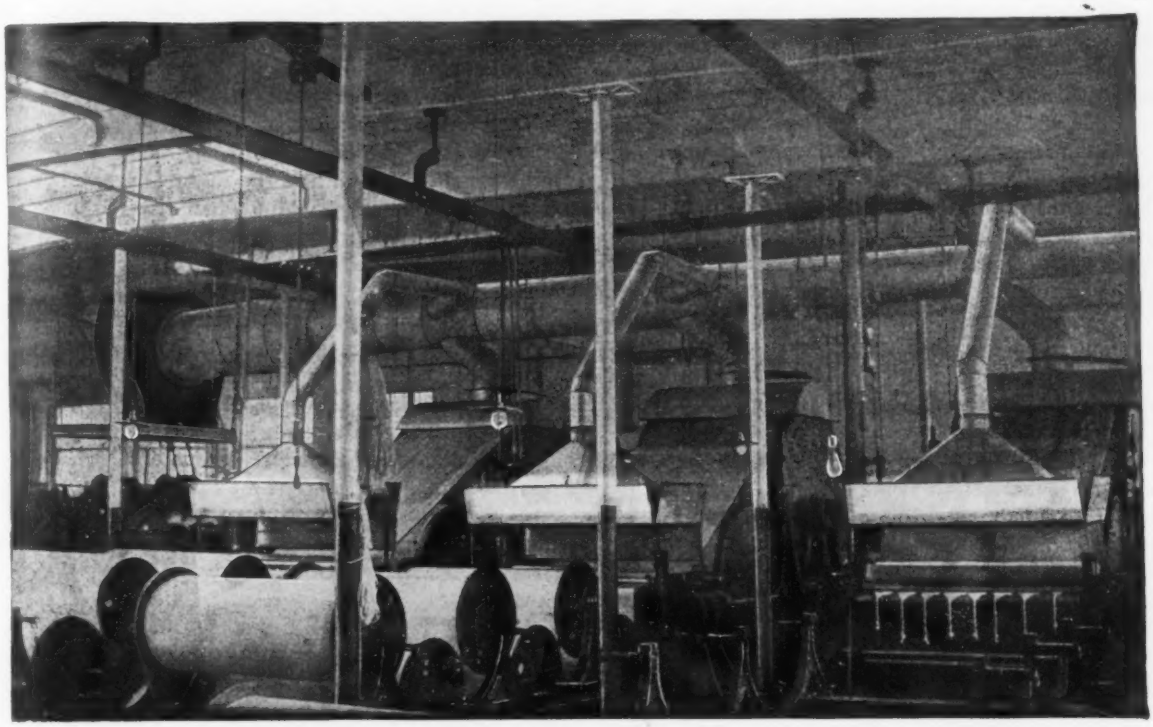
It appears that the water in the size used per slasher per hour amounts in round numbers to 215 pounds, while the average temperature of the room is 84 deg. F. Inasmuch as all this water must be vaporized, the atmosphere of the room is called upon to absorb 215 lbs. of water per hour.

The capacity of air for absorbing moisture increases very rapidly with the temperature. Air at 70 deg., under ordinary conditions, has a relative humidity of about 70 per cent., that is to say it contains 70 per cent. of the total amount of vapor which it is capable of holding in invisible suspension.

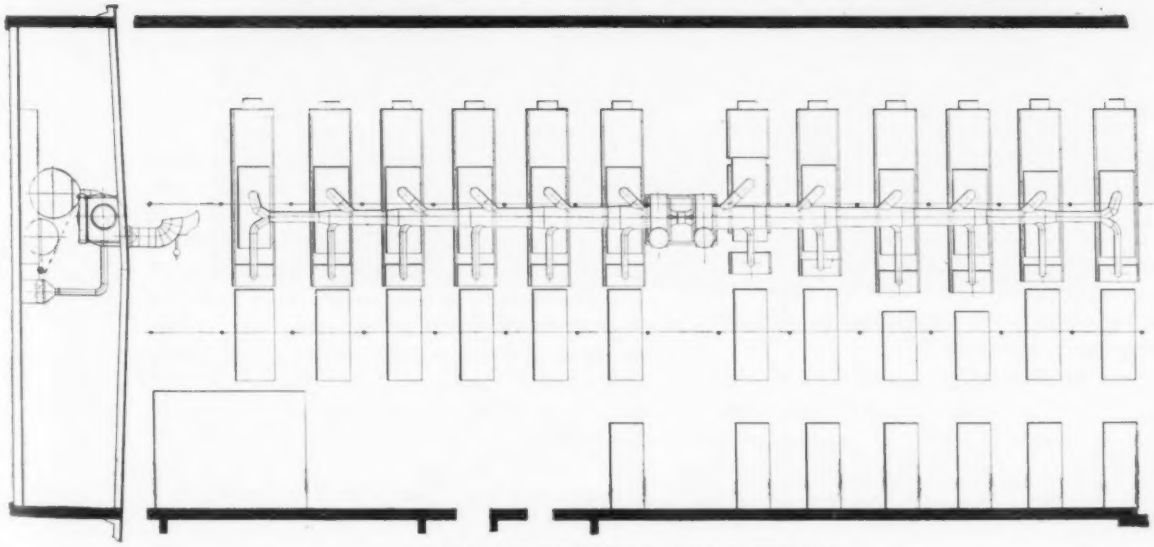
The weight of a cubic foot of air at 70 deg. is .07425 lbs.; the water alone weighing

.001153 lbs. But air at 84 deg., the average temperature of slasher rooms, weighs only

weight of a cubic foot of air has decreased over 2 per cent., the capacity for absorbing



SLASHER ROOM OF GROSVENOR-DALE CO., EQUIPPED WITH THE STURTEVANT SYSTEM OF REMOVING STEAM.



PLAN OF THE GROSVENOR-DALE SLASHER ROOM.

.072597 lbs., while the vapor it will contain amounts to .0015778 lbs. That is, while the

moisture has increased about 37 per cent. There, if the original humidity of the air at

70 deg. was 70 per cent., the actual amount of vapor in it would have been .0008071 lbs. If this air be heated to 84 deg. it can take up .0007707 lbs. to each cubic foot before becoming saturated. The amount of air required to absorb 215 lbs. of vapor is, therefore (215 ÷ .0007707), 278,960 cubic feet.

Doubtless 10,000 cubic feet per slasher would represent the average cubic contents of a slasher room. That is it would contain on the above basis only about one-twenty-eighth of the volume of air necessary to take up the vapor produced in an hour.

To prevent over saturation (which is accompanied by the deposition of moisture), there must be a rapid and continuous change of air, and as has been shown by experience. satisfactory results can be secured only by creating and regulating the circulation by mechanical means.

The accompanying illustration indicates the method adopted by the Grosvenor Dale Co., North Grosvenor Dale, Conn., to solve the problem. Suspended overhead is a Sturtevant exhaust fan. This is connected with both the cylinder and size box hoods by means of piping, and draws from them the vapor as fast as it is generated, discharging it above the roof. The rapidity with which the air is changed may be as great as desired, and the result is a clear dry slasher room, the avoidance of dripping walls and ceiling, and the opportunity for more rapid drying and increased output.

This system was designed and installed by the B. F. Sturtevant Co. of Boston, Mass., who have made a careful study of the subject.

It is said that the little corner of the British Isles called Lancashire is the moistest spot in the world, a fact that accounts for the extraordinary concentration of the cotton spinning industry there.

The Paisley shawl was woven face downwards so that to the weaver there appeared only a confused mass of floating threads. Extreme care was necessary in order to prevent any false shot from marring the design, and every inch had to measure to the minutest fraction the precise space allotted by the pattern.

AN IMPROVED CLOTH SPREADER.

The maximum production of perfect goods can be obtained only by bringing every machine and process in the mill to its highest efficiency. It may happen that the good results of perfecting a portion of machines and processes may be neutralized by a neglect of other details. One of the important details in the finishing room, which is often neglected, is the expansion rolls for removing longitudinal wrinkles from the goods and presenting the cloth to the machine in a smooth condition without having the filling distorted by irregular stretching, which is often caused by using fixed rollers, the disadvantage in this case being that all the goods get the same expansion; whereas some fabrics owing to their more delicate structure are not able to stand the maximum strain.

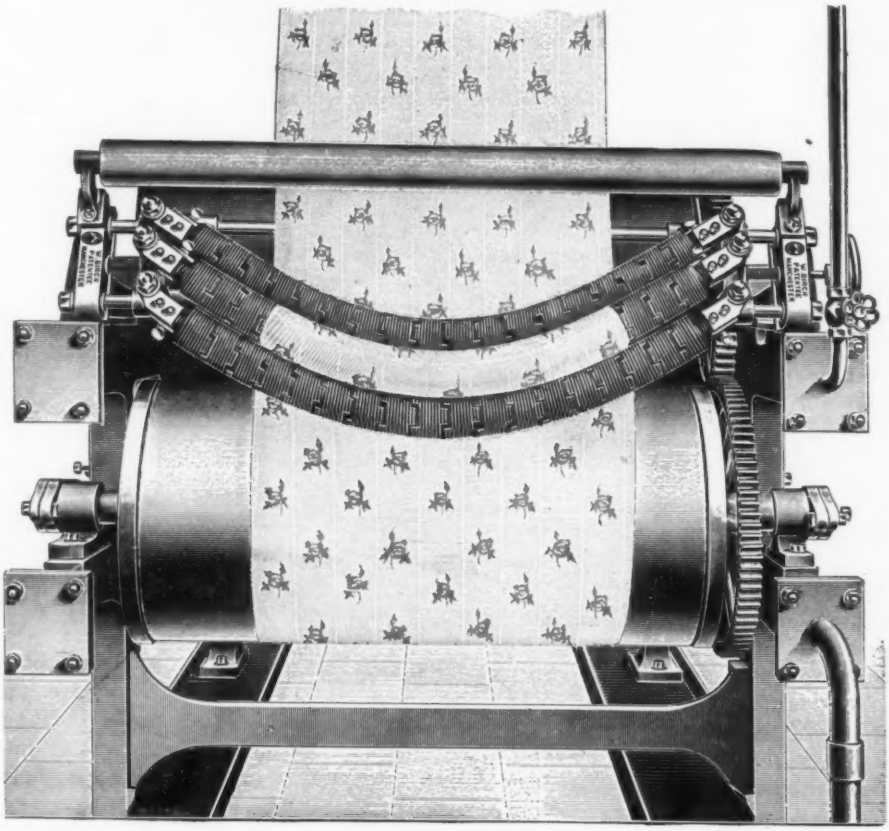
To overcome the objections to the fixed rollers the cloth expander shown in the accompanying illustration was invented some years ago by William Birch of England, and has been thoroughly tested in many of the best mills on both sides of the Atlantic. Until recently this Birch machine was controlled in America by the Lockwood Manufacturing Co., East Boston, Mass. The textile finishing machinery business of this firm has been transferred to the Textile Finishing Machinery Co., 17 Exchange Place, Providence, R. I., who will in future be the sole American builders of this machine.

The expander consists of a series of three rollers of special construction. Each roller is built upon a flexible shaft composed of strips of steel, while the ends of these shafts are held by swiveled heads. On each shaft are first strung a number of brass bearings and the outer parts are inserted later. The result is a series of small rollers, each interlocked with those on the other side, but revolving on its own bearing, and the whole mounted so as to be capable of bending to any desired curvature. If the rollers are straight the cloth passes over without being expanded, but if the swiveled heads which carry the flexible bars are turned at an angle by being screwed inwards, so as to give a

curvature to the rollers, the expansion increases in the ratio of the curvature. The expansion is effected by bringing the cloth into contact with the rollers on their concave side, which are compressed; the cloth then passes to the convex side where there is a greater circumference.

The swiveled heads which carry the flexible bars are mounted on slides and are directly connected with each other on either side of the machine. A screw passes through each connection and as the thread is right and left hand respectively at each side, both sets of ends can be operated simultaneously by the hand wheel.

The machine is constructed in double form for double machines in which two pieces are fed at the same time. In such a case each expander can be adjusted to suit the requirements of each string of pieces. Among the advantages claimed for this machine are avoidance of bending in the weft; and the stretching of the cloth to its full width. It is very useful on drying machines and water mangles, and is fitted with improved bearings which do not require oiling. The liability of damage to the cloth from oil spots is thus entirely obviated. Further information can be obtained upon application to the builders.



THE BIRCH CLOTH EXPANDER (TEXTILE FINISHING MACHINERY CO.)

The difficulties surrounding the manufacture of perfect worsted yarn are greater than in any other branch of the textile industry, and nearly all of them are incident to the processes prior to drawing and spinning.

TRADE-MARKING TEXTILES.

It is of vital importance to the permanence of a textile manufacturing enterprise with a meritorious product that the knowledgs of its merit be stamped upon the mind of the consumer. This can best be done by a trade-mark which identifies the product wherever offered for sale.

The public is subject to constant imposition in the purchase of goods, more especially fabrics and wearing apparel, of which it is unable to judge the quality until they have been put to the rigid test of use. This is so largely true that there is a general willingness to pay an increased price, if necessary, for the satisfaction of knowing that a hat, a garment, or a piece of goods bears the brand of a reputable manufacturer.

Doubtless the chief reason why the textile manufacturer is not benefited more largely by this tendency of modern business is the difficulty of identifying his goods. In some instances a name has been adopted and extensively advertised, but in the absence of any means of identifying the goods in the piece, the benefits derived have not been in proportion to the amounts expended in advertising.

If a manufacturer proposes to advertise his goods a trade-mark or means of identification is the first requisite of such a course, and is of vital importance. In the interesting series of articles which have been running in the Textile World Record for the past year on the subject of "Why Textile Goods Should be Advertised," it is clearly shown that proper means of identification is absolutely necessary. Advertising men when called in to consult with manufacturers who are contemplating an advertising campaign, usually find that the manufacturer has no trade-mark, or if he has one, does not use it in identifying his goods, and the advertising man is usually confronted with the objection which seems to the manufacturer an insuperable one,—that his goods cannot be properly trade-marked so as to be known when cut up, as there has been no satisfactory means of doing so except by marking on the selvage.

Within the past year a new process of stamping has been introduced which seems to possess all the qualities necessary to meet this situation. It has the elements of simplicity, economy and marked attractiveness, the most elaborate trade-marks being reproduced in fine detail and stamped on any class of goods with the distinctness of a steel plate impression. This process is known as the Kaumagraph process, which freely translated means heat printing. The process seems to be a distinct addition to the graphic arts, inasmuch as it provides a means of printing or stamping any class of fabric from cambric to blankets with the same facility and distinctness with which the printer produces these results on paper. Moreover, this new process embodies a distinct advance on the printing art in that a direct impression can be secured in silver or gold bronze without the use of bronze powder, or in any way adding to the expense.

The Kaumagraph stamps are made on a fine grade of tissue paper and are furnished to the manufacturer in boxes of one thousand each of any design and in any color. They are transferred from these tissue slips by means of a heated iron, so that no special apparatus is necessary and the impressions can be made just as rapidly as the goods can be handled. Whether the stamp is used on cotton, woolen, silk, satin, or underwear, the result is equally distinct, owing to the fact that the heat carries the chemical substance into the recesses of the fabric in a way which of course would be impossible with a hand stamp. The composition is of such a nature that it will wash out readily from white goods without leaving the slightest injury, and on woolens the stamp is used on the back of the fabric so that it is in no way detrimental. On silks and satins the stamps are usually put on the selvage, though in some cases on the reverse side at intervals of a yard or two.

Whether a manufacturer means to advertise through magazines or not, if he does not trade-mark his goods and thus identify them, he is throwing away one of his most valuable assets and losing one of the best methods of advertising which costs practi-

cally nothing. He owes it to himself and to his customer to give the latter the means of knowing what the goods are, and how to get them the second time if they give satisfaction.

Some of the largest manufacturers of woolens, flannels, knit goods, rainproof fabrics, etc., have been quick to see the availability of this process, and it will appear extensively on the coming season's goods. Full information, together with samples for trial, will be sent to any manufacturer interested by addressing the Kaumagraph Company, 156 Fifth Avenue, New York.

In 1774 England passed a bill to prevent the exportation of cotton machinery.

ELECTRIC POWER IN TEXTILE MILLS.

The application of electric power to textile machinery long ago emerged from the field of experiment. The new power had to overcome the conservatism of textile manufacturers and contend with the superabundant zeal of its advocates. It overcame these obstacles and is now in the textile mills to stay. Perhaps nowhere are the intrinsic merits of electric power for textile work more clearly shown than in silk manufacturing, where the delicate material is very liabe to injury by variations in the speed of the machinery. It is stated that wherever adopted for silk mills electric power has effected a marked improvement in the

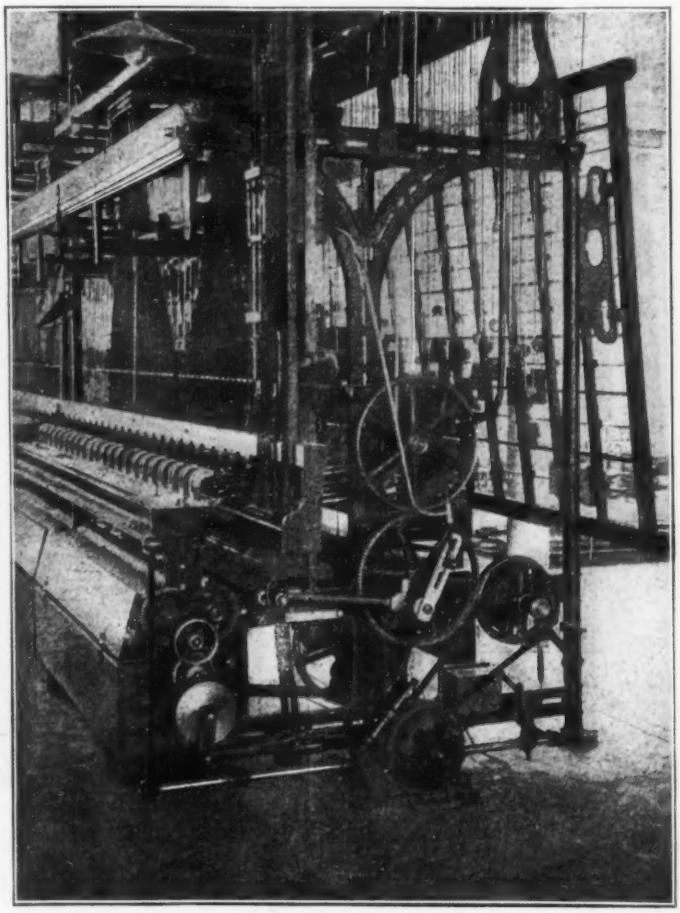


FIG. 1. A RIBBON LOOM DRIVEN BY ELECTRIC POWER.

smoothness and quality of the product. A recognition of this fact has led to the use of electric power in nearly every new German silk mill. Fig. 1 shows a ribbon loom driven by electric power.

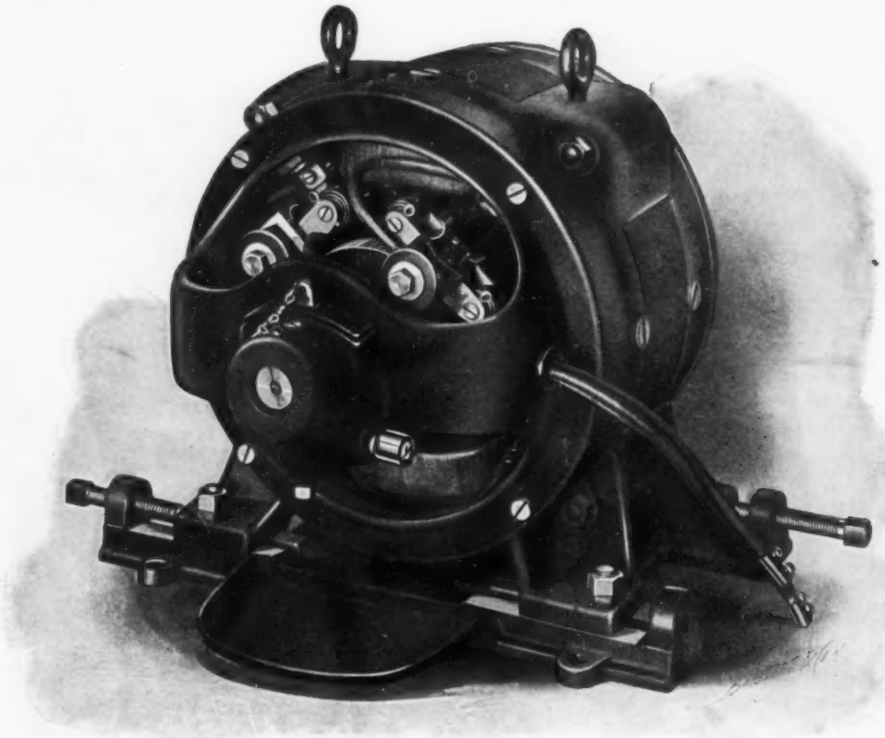
This method of driving textile machinery is equally advantageous in other branches of the industry, cotton, woolen, worsted and linen. Fig. 2 is a view of the drawing and twisting room in a new Italian cotton mill at Cordenons, which we described in our January issue. The machines are driven by individual motors. The picture alone shows some of the advantages of this system of driving, namely, the absence of belts and shafting, and the resulting increase of light and freedom from obstructions to the operator's movements.

FIG. 2. DRAWING AND TWISTING ROOM. ELECTRIC POWER.

Important as these benefits are, there are others still greater when electric power is applied intelligently and with due regard to the special conditions of the problem. Among these may be mentioned a reduction in the cost of installation of the plant and of the power at the machine, with greater convenience of operation. An additional merit is the possibility of recording accurately the power consumed by each machine or group of machines; also the variations in the consumption of power.

The many advantages of electric power properly applied in textile mills make the Lundell motors and generators built by the National Electric Co., Milwaukee, Wis., of especial interest to textile manufacturers. This company has made a special study of the uses of electricity in the textile industry and are prepared not only to supply the most improved appliances, but also to give manufacturers the benefit of their technical knowledge and experience. They recognize the necessity, not only of applying electricity to textile machinery, but also of applying it right, and that in this way only can the best

results be obtained. The conditions in different mills vary so widely that each power user desiring to receive the full benefits of electric power should state in detail to the National Electric Co. the conditions in his mill and the particular objects desired. In this way the electric apparatus, of which we show views of a few types, can be arranged in the most effective manner.



THE LUNDELL UNIVERSAL MOTOR.

THE MANUFACTURE OF COTTON BATTING.

The Philadelphia Textile Machinery Co., Philadelphia, Pa., make a specialty of building machinery for making cotton batting, and their improvements in this line are embodied in the Proctor batt and lap outfit.

Heretofore the machinery employed has often been an old card of almost any style or character and a lap drum upon which the carded material was wound until it became sufficiently thick for the purpose intended, when it was cut off and a new lap or batt started. This method naturally resulted in a great quantity of waste, as it was impossible to make more than one size of batt or lap on the lap drum. Also, the quality of the batt was very poor and had but little strength.

With the Proctor batt and lap outfit, however, all this is changed, as it is possible to make a batt or lap of any desired thickness, width and length, which is very much superior in quality to anything heretofore obtainable. This machinery consists of a Bramwell self feed, a Proctor garnett machine and a Proctor Blamire lapper, as illustrated at Fig. 1. The stock is thrown into the self feed hopper and comes out on the Blamire lapper in a batt of just the size and weight required, ready to go to the mattress or comfortable-making department where it is made up into goods for the market.

Great resiliency and strength are found in this product and it is now being used for almost everything requiring a cotton or wool filler in "felt" or batt form. Only one man is required to operate a machine that will produce from 800 to 1200 lbs. of "felt" or batting, depending upon the character of stock used for the purpose, and it handles the lowest or highest grades of stock with equal efficiency.

In the manufacture of comfortables a sewing machine, Fig. 2, having a long arm, is used. This sewing machine is manufactured by the Wheeler & Wilson Mfg. Co., Bridgeport, Conn. The covering for the comfortables is cut the proper size and on top is placed a batt of the proper size, while on top of this is laid the other part of the cover. After which the comfort is placed on the large table of the sewing machine and

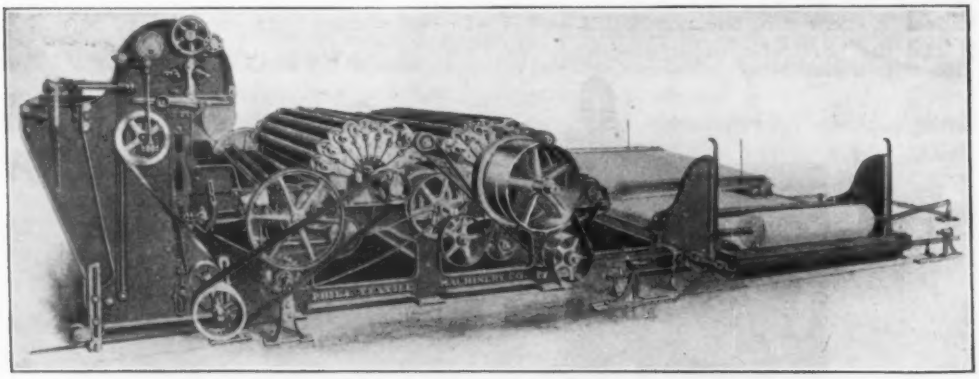


FIG. 1. THE PROCTOR BATT AND LAP OUTFIT.

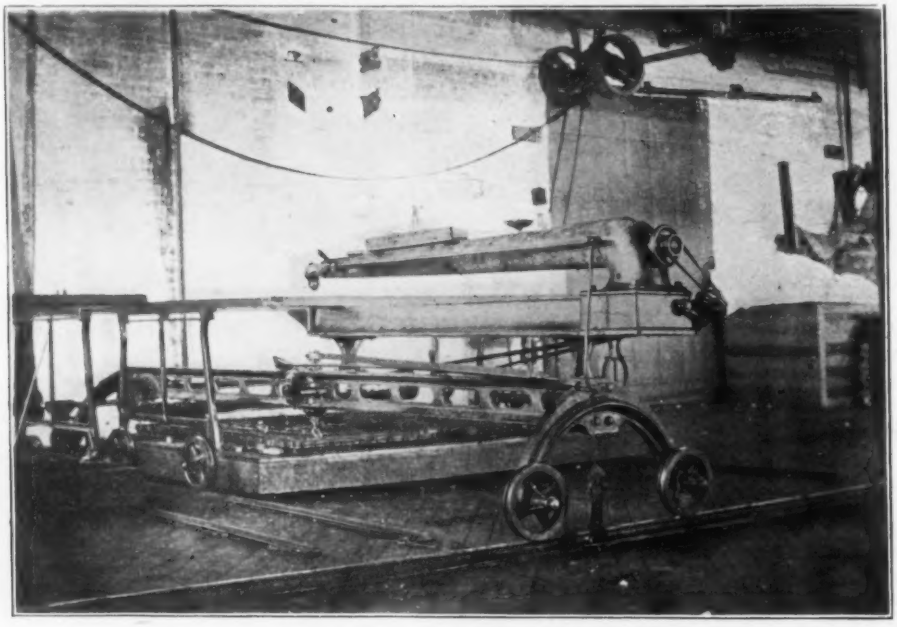
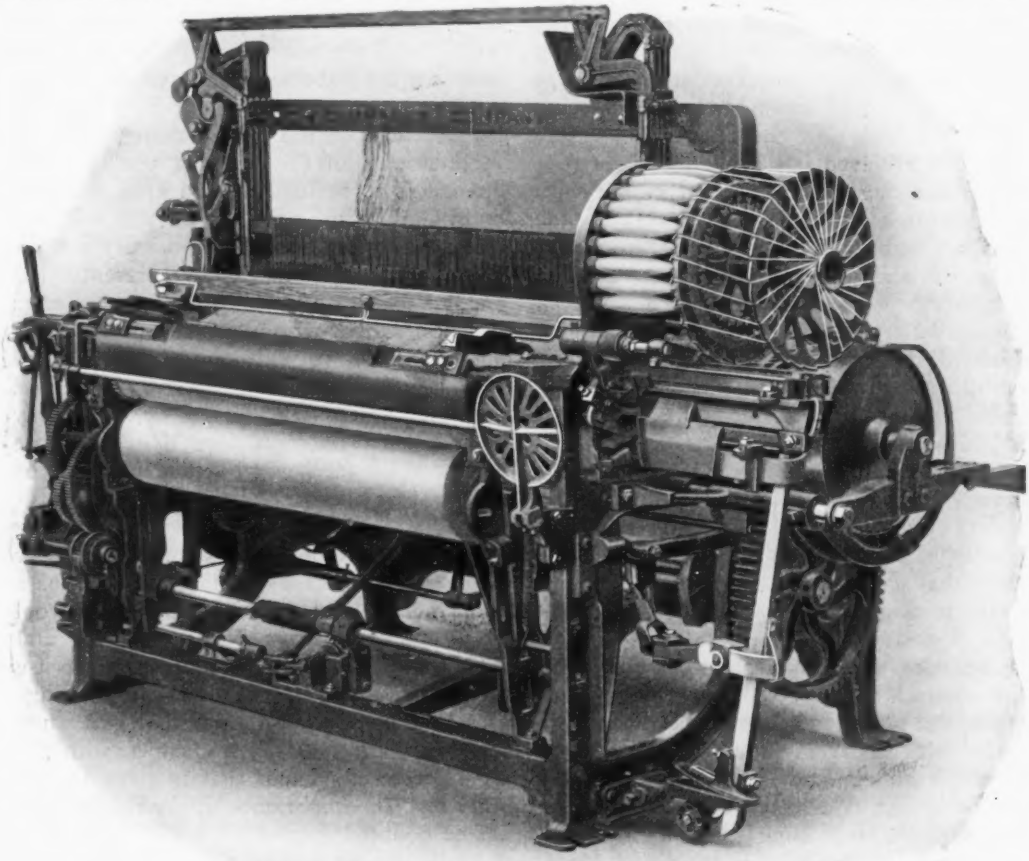


FIG. 2. A SEWING MACHINE FOR COMFORTABLES.

sewed up at the edges and the design sewed in.

In the manufacture of cotton "felt" mattresses the tick is made up with one end left open. This tick is then fastened with the open end up against the mouth of the mattress stuffing machine made by the United Mattress Machinery Co., Boston, Mass., and after the proper number of batts have been placed in the stuffer the plunger comes forward and forces them into the tick very accurately. The open end of the filled tick is then sewed up, the mattress tufted and completed.



THE DRAPER E MODEL LOOM.

THE DRAPER E MODEL LOOM.

The accompanying illustration shows the E Model loom built by the Draper Co., Hopedale, Mass., and equipped with the Roper harness motion using a steel heddle warp stop motion. The new outside bearings for pulley shaft and the Bolton loom seat are also shown. The Draper Co. consider the new Roper harness motion to be one of the most interesting mechanical devices they have ever introduced. It will accommodate two, three, four or five harness, and weave a wider range than any ordinary device for this purpose. The cams and operating parts are all inside the loom where they can be easily changed when necessary. There are no harness cams or connections to the harness below the warp inside the loom frame. Many of these machines have been running for months with entire satisfaction.

The annual consumption of cotton throughout the world is estimated at 12,500,000 bales of 500 pounds each.

Dyeing, Bleaching, Printing, Etc.

THE TESTING OF MILL SUPPLIES.

This is a proposition that is more and more attracting the attention of manufacturers and the larger textile concerns, not only on account of the necessity of greater regularity and uniformity demanded in their output, but also as a means of accurately determining the actual value of all supplies capable of being tested. At one time the question of textile mill tests resolved itself into the mere routine of checking the receipts of dyes, but since competition has become keener, not only the dyes are subjected to closer scrutiny, but soaps, oils and other articles pass through the laboratory. Of recent years much has been said and written concerning the purchase of standard or staple supplies "by contract," and this has given the mill chemist a considerable amount of work that was unknown only a decade ago.

The older mill laboratory was at best only a crude apology for such a place, and in the present condition of trade it seems almost a miracle how work was ever done in such places that passed with satisfaction.

Dye testing today is a matter of importance, especially in mills where large quantities are consumed, but all the work now done with colors is not directed to check up purchases, but rather to ascertain the possibility of the color under investigation, its field of usefulness and its most economical method of application. While the manufacturers of dyes maintain large laboratories for the special purpose of determining their usefulness, many unusual applications are worked out in the mill laboratories that never reach the outside technical world, and are quite unknown even to the dye manufacturers. The analytical work of mills is continually growing in extent, and where formerly it was the custom to accept many articles upon faith, they are now minutely examined, and the true commercial value fixed. This applies to soaps, lubricating oils and greases, soluble oils, soda ash, caustic, natural dyes, special chemicals, etc.

In a large mill, the proper equipment of a laboratory is a result of gradual increase as new work is taken up, and should include only the most approved types of apparatus. Those who are interested in this work, and who saw the elaborate display of the German textile chemical exhibit at the St. Louis Exposition cannot but be impressed with the requirements of this kind of testing. The appliances to be used depend upon the general nature of the work done in the mill, and if it is a print works, the laboratory will require a number of machines representing, in fact, a miniature print works, including a steamer, so that when a particular dye is being examined, it will pass through every phase of the several manufacturing processes, only on a small scale. If the mill does only dyeing, then the miniature dye baths are used, and the mechanical arrangements to be used will be almost as extensive.

In this country greater attention is being given to the testing and examination of raw wool. Where once it was the custom to pass upon the value of a given shipment of wool by means of a simple bucket scouring and drying, now it is becoming the custom to use the "conditioning" process, which gives figures that possess absolute value, and when such tests are made by a chemist, with the same care as to details that is given to any other test, the importance of the results cannot be doubted.

At the present time wool conditioning even by large purchasers of wool is rare, but the time is rapidly approaching when all sales and purchases of raw wool will be done upon the certificate of tests made in accordance with scientific methods as is now the case for silk.

Many dyers of the old school looked with disfavor upon the coming of the chemist, some even going so far as to regard him in the light of one whose mission was to upset

the old customs of the craft, rather than as a guide to exact methods of work. There is no doubt, however, that with the introduction of the chemist in the mill, some of the time honored customs were relegated to the rear, and that new methods were put into practice which have proven their worth. Since the various researches along the line of colors have given to the trade many products of great value that can only be properly employed under the direction of men with some chemical knowledge, there has been a gradual increase in the number of students in the textile schools pursuing courses leading ultimately to important positions as dyers in many mills, but it does not seem that the average textile school having a dyeing course aims to equip its colorist graduates with a greater knowledge than is required to fill a position as shade matcher, and this is not what the more progressive mills require.

The mill chemist of today should possess a general technical knowledge of chemistry, together with an absolute knowledge of analysis and of commercial products. He should be pretty well informed in natural history, especially regarding the wool and hair yielding animals, and fibre yielding plants. He should also be practically familiar with the use of the microscope, and use it. It is not too much to say that a well equipped mill chemist should possess a liberal education supplemented by a thorough scientific training along the above lines, as he will find that there will be many occasions to overcome obstacles that an ordinary man would never see.

The writer has advocated this course for a long time, and knows instances where such men have gone into mills ostensibly to fill minor positions, but with the real object of acquiring practical experience, especially regarding the weak points of processes, etc., and then rose to the coveted position where direction and control were theirs.

It is a mistake on the part of many young men who work for a short time making dye tests, and then become more or less familiar with the outlines of a few processes and names of products to imagine that that is the only necessary stock in trade to enable them to embark as "chemists." Such men usually remain stationary solely from the fact that they have reached their limit of experience and have not the ability to think, and no greater opportunity exists for a young man who can think than in a going textile mill.

THE PREPARATION AND DYEING OF JUTE.

This fibre is one of the most interesting, if not one of the most important that finds great and growing application in the textile industry, possessing many qualities that are not shared by other fibres of similar origin, and which are valuable factors in directing its use for the manufacture of certain classes of fabric that are of considerable commercial value.

To many persons jute is synonymous with burlap for bag manufacture, but since processes have been found that enable the fibre to be bleached and dyed in a satisfactory manner, the plebeian idea of the uses of jute must be set aside, and a more refined position given it.

A tour through any of the large department stores in our large cities, or inquiries at any interior decorating establishment will convince any one regarding the wide range of uses to which jute is put, while its popularity from an artistic standpoint will not be overestimated.

HISTORICAL.

The jute plant has been known and raised in India from the very earliest times for the valuable properties of its fibre, but it has only been since the beginning of the nineteenth century that the systematic treatment of the plant for its fibre for use in textile manufacturing received any attention. As a matter of fact, the only "textile manufacturing" that jute was consumed in for many years was the manufacture of continually increasing quantities of bagging for use in baling the American output of cotton; but it was not until the late 60's or early 70's that jute bagging became the almost exclusive article for this purpose, and consequently the jute industry—not alone from the agricultural viewpoint but the manufacturing as well—has increased to

immense proportions, and with the prospect that it will continue to grow for the reason that we do not have in sight any other fibre that is fully able to take its place.

BOTANICAL.

Jute fibres are obtained from that part of the plant known as the bast, and consists of that portion of the stalks next to the outer crust or rind, and which appears when viewed under the microscope to be made up of innumerable "bundles" which are actually the fibres of commercial value. The scientific name is corchorus capsularis, while the common names are too numerous to give here.

The plant grows to a height of from 5 to 10 feet, the average diameter of the stalk being over half an inch, and with few branches except near the top.

While the jute plant has been cultivated in many parts of the world, India retains its preeminence in this regard, the greatest crops of the fibre being raised in Bengal.

TECHNICAL.

The commercial fibre is separated from the plants by a process of cold-water retting; the leaves, branches, and capsules are removed from the stalks which are immersed for several days in the slow moving water of streams, when the fibre portion may be removed without any difficulty, and in considerable purity. The dried fibre is made up into bundles, the length of which varies from 6 to 8 feet. For textile manufacturing purposes, not all of this length is utilized; about 12 to 14 inches from the thick end is usually cut off, and finds its outlet in the manufacture of paper stock, under the name of "jute butts." That portion of the fibre used for textile purposes is softened with an emulsion of soap and oil, and is afterwards heckeled and spun into threads, and then woven into cloth, or otherwise utilized.

In the present article it is our purpose to confine ourselves more particularly to the preparation and treatment of jute fabrics from a textile point of view, but more especially such as require bleaching, dyeing, etc.

Jute, unlike many of the vegetable fibres, though used for coarse fabrics, requires considerable care as it is incapable of resisting harsh treatment.

BLEACHING.

While there are known a number of practical processes for bleaching jute, the one yielding perfect results is yet to be discovered. Those which follow, however, are to be recommended only by the fact that they are at this date actually used in various mills where jute is treated.

For Jute Pieces. Pass through a 1/2 per cent. solution of silicate of soda, heated to 160 deg. F., then through a second solution of sodium hypochlorite of such strength that the bath does not contain more than 1 per cent. of available chlorine as determined by a volumetric test. This hypochlorite is made by acting on fresh solution of bleaching powder with one of soda ash, adding the latter until no further precipitation of calcium carbonate is noted, let settle, and draw off the clear portion for use, diluting with water until the proper strength is obtained.

After passing through this solution the goods are well washed and passed through a weak muriatic sour at 1/2 deg. Tw., to which has been added a small quantity of sulphurous acid. This treatment is to ensure the removal of certain substances that tend to discolor the otherwise bleached material, and also to leach out the small quantity of iron that is always found in the crude jute fibre. Finally, wash well and dry, but if it is intended to print color on the fabric, pass the cloth through a solution of bisulphite of soda containing about 2 per cent. of sulphurous acid, squeeze the excess of liquor out of the cloth, allow to lie covered with damp burlap for 3 or 4 hours and afterwards dry over cans. This treatment leaves only neutral sulphite of soda on the fibres which does not affect the printing colors during steaming, but preserves the fibres against the oxidizing action of the steam chest atmosphere. The loss in weight by this process is sometimes as great as 8 per cent.

Another process is to subject the jute alternately to the action of potassium permanganate and sodium bisulphite, but the cost is against it, although the results are very good when properly conducted.

A perfect bleach is almost impossible to secure, as the fibre will not stand the necessary treatment. The only way to obtain passable results is to bleach with the first process above indicated, and then to make use of a tinting blue, for which purpose some of the so-called "soluble blues" answer very well.

DYEING.

Jute, like all the other fibres of similar origin, is not very difficult to dye, but unlike most fibres, unless some special care is taken, uneven results will always be obtained, owing to the great affinity that the fibre has for most colors.

At the present time, three broad classes of dyestuffs are recognized as being of particular interest to the jute dyer, namely, the basic, acid and direct colors, each class having advantages over the others according to the uses to which the dyed fabric is to be put. Mordanting of jute is unnecessary.

Dyeing Jute with Basic Colors. Prepare the dyebath by heating the water to about 80 or 90 deg. F., work the jute for a few moments to ensure that it is evenly wetted, and then add a portion of the dyestuff, previously dissolved in warm water; gradually increase the temperature to 175 deg. F. at the same time making further additions of dyestuff, until the proper depth of shade is acquired. Work for 20 to 30 minutes after the last addition, and then lift, wash and dry.

Some basic colors may be dyed at a temperature of 180 to 190 deg. at the start, but they are so few that it is unnecessary to mention them. Others of this same class require for the best results the addition of a small quantity of acetic acid, usually a pint to a kettle full of water; such dyes being the methyl violets and malachite (acid) green.

With the following line of colors the jute dyer is able to produce almost any desired shade:

Safranines B and Y.
Methyl violets of all shades. (The bluest Methyl Violets always contain Methylene Blue as a mixture.)
The Fuchsines.
Bismarck Browns. (Use always the most soluble types.)
Chrysoidines.
Malachite Greens.
Brilliant Green.
Methylene Blues.
Auramine.

Dyeing Jute with the Acid Colors. These colors always yield the brightest shades, and are applied to jute from a dyebath made slightly acid with about 2 per cent. of oil of vitriol, together with 5 per cent. of alum.

The color is added slowly during the heating of the bath until it boils, when the steam is shut off and the yarn or pieces worked for half an hour. Lift, wash and dry. This class of colors includes the:

Erythrosines.
Eosines.
Cotton Blues.
Croceine Scarlets.
Azo Scarlets.
Fast Reds.
Acid Yellows, Chrysoine, etc.
Acid Orange.
Acid Blacks of the Naphthol group.

The first two above mentioned are sometimes dyed with a large addition of common salt to the dyebath, boiled and dried without washing, but the results are not desirable.

Dyeing Jute with the Direct Colors. This class of colors is always applied to jute from an alkaline or neutral bath, and are receiving very great attention from dyers and manufacturers of burlaps for interior decoration, for which purpose these dyes are better suited than any others, as they are fixed more permanently upon the fabric and are much faster to light.

For dyeing yarn the kettle is prepared with

Direct Color	1	to 3	pounds
Glauber's Salt	10	to 20	pounds
Soda Ash	1½	to 2½	pounds

Enter at 180° F., raise the temperature to the boil, and keep boiling for one hour or until the bath is exhausted or the proper shade is obtained. With light percentages the color is quickly taken up, but with heavier shades it will be found economical to maintain the standing kettle. Lift, wash well, and dry.

BURLAP FOR DECORATIVE PURPOSES.

This is always dyed in the piece, and with colors that will not be acted upon by the glue sizing that is put on the back of the finished fabric. Some manufacturers are using

caseine as the burlap size, and with very good results.

Dyeing the piece-goods burlap, a padding machine is always employed, as this enables the dyer to obtain in a very short time the heavy shade usually required. The color bath is made up with a very small quantity of water, or only sufficient to fill the box of the machine, and adding a small amount of some soluble thickening such as dextrine or caseine. This latter product has many advantages over any other similar material, and yields very good results on the finished piece.

The "color" is made up in a cask or barrel without any other addition than the thickener, and then poured into the "sow box" or trough of the machine, giving the pieces two runs in opposite directions so as to secure shades. The padded goods are well squeezed through nipping rollers and then dried and "backed." The temperature of the color paste should be boiling or nearly so, because the higher the temperature the better the penetration.

Printed patterns or designs are often applied to jute, and the process is exactly the same as for calico work, except that the color paste is made very much thicker, and that the color in a number of instances is not fixed by steaming.

Often white figures are printed upon the dyed burlaps, these being made up of a white pigment, such as blanc fixe thickened with albumen or caseine.

As a wall covering, burlap is certainly one of the most satisfactory we have, and it will, no doubt, continue to increase in popularity.

DISCHARGE EFFECTS ON COTTON VELVETS.

As a rule the greater portion of all cotton velvets are dyed with the direct dyeing colors which for the purpose can be conveniently divided into three broad groups represented by the following colors:

Group I. Dyes that are readily discharged. Diamine Yellow N, Diamine Gold, Diamine Brown, Diamine Catechine B and 3 G, Diamine Grey G, Diamine Rose B D and G D, Diamine Violet, Diaminogene extra, Diamine Black B H, Oxydiamine Black A, and many others.

Group II. Dyes that are difficult to discharge. Cotton Brown A and N, Oxydiamine Brown G, Diamine Reds 5 B and 6 B, Diamine Fast Red F, Diamine Violet N, Diamine Jet Black O O, and other similar blacks. together with certain colors of the first group that are developed and diazotized with Phenylamine Diamine, or Resorcine.

Group III. Dyes that cannot be discharged. Thioflavine S, various types of Diamine Fast Yellows, Diamine Orange D, etc.

The general process is as follows: The dye bath is made as concentrated as possible, and the dyeing done preferably on a jigger, but any other machine capable of handling pieces will answer. The goods are dyed after being singed, but not necessarily boiled out. This latter practice is better to adopt, however, as it produces more level shades than if wetting-out is not done. After dyeing, the pieces are dried over cans in the usual manner, and then printed with a discharge paste made as follows:

Wheat Starch	13 parts
Water	38 parts
Tragacanth Paste (65 to 1,000)	17 parts
Citric Acid	2 parts

Boil well together, and while still hot, add

Tin crystals	24 parts,

stir well, and when cold, add

Acetate of Soda	6 parts.

This will make the standard stock paste, which for use must be diluted with three parts of the following

REDUCING PASTE.

Wheat Starch	10 parts
Tragacanth Paste (65 to 1,000)	20 parts
Water	65 parts
Acetic Acid	5 parts

Boil together for half an hour. Print, steam in a universal steamer, rinse well and dry.

In preparing these pastes, the starch must always be mixed with the cold water, and when a paste is made, add the tragacanth paste and the other ingredients, then boil. Any other method is sure to make a poor working mixture.

Many of the dyes belonging to the groups mentioned are capable of combining with and fixing the basic dyes, so that a very great variety of modes can be produced. The procedure is to dye in the usual manner, and then discharge, wash and pass through a bath containing the topping color.

The finishing of these goods is a matter of much concern to many manufacturers. After having been dyed, discharged, and dried, the pieces are sheared and then well brushed to remove the loose fibres, after which they are "waxed" by being run over a machine carrying arms provided with bars of beeswax and oil, revolving at a fair speed. This waxing imparts to the pile not only a peculiar lustre, but also a "handle" which is much appreciated. The exact composition of the wax varies with different finishers. A composition that is excellent and which always gives good results is to melt together 3 parts of good quality yellow beeswax and 1 part of high melting paraffine wax, and when the mixture is made, incorporate with thorough stirring 4 per cent. of castor oil on the weight of the wax. Partially used bars are simply remelted with the new batch. When old and dust-covered bars are to be worked over, it is found best to melt and pass while hot through a cotton cloth.

COLOR PENETRATION OF HEAVY FELTS.

The question of wool felt dyeing is always one of importance, as it is the desire to cause proper penetration of the felt, but sometimes it appears to be almost impossible to secure this result, so the following notes may prove of interest.

The felt should be previously wetted out by boiling, and for such a length of time as will ensure the displacement of all enclosed air. Then enter the dye bath made up with 20 per cent. of Glauber's salt and one-third the quantity of acid dyestuff. The temperature should be about 130 deg. F., and after entering increased to a boil within half an hour, and kept boiling until the dyestuff is taken up, after which the remaining portion is added, and the boiling continued for half an hour further. Now, add 2 per cent. of oil of vitriol at intervals of 20 minutes or until the bath is completely exhausted.

Light weight felts may be dyed with both the Glauber's salt and one per cent. of oil of vitriol, and after half an hour, add a further quantity of vitriol to complete the exhaustion.

A so-called "short boiling" process is as follows: Charge the dye bath with the color, Glauber's salt and the vitriol, enter the felt in the cold bath, work for one-half to one hour, and gradually increase the temperature to the boil, continuing until the bath is exhausted.

Alkali Blue, much used for dyeing bright blue shades, is dyed by boiling the felt in a bath containing from 3 to 10 per cent. of borax, taking the precaution to keep the bath always alkaline. Allow to cool, then add the proper quantity of dyestuff, work for 3/4 hour at a gentle boil, lift, rinse, and pass through a fresh bath heated to 100 deg. F., containing about 3 per cent. of oil of vitriol.

Many dyers prefer to use bisulphate of soda instead of oil of vitriol, in which case for every one part of the latter acid use three parts of the bisulphate.

One precaution is to be assured that the felt is free from soap or grease, and that it is well turned during the dyeing, especially when the acids are added.

New Color Cards.

Domingo Alizarine Blue; C. Bischoff & Co., New York.

Two samples of raw wool, two of woolen yarn and six of woolen piece goods dyed with different percentages of Domingo Alizarine Blue R and G. Two of the samples have white cotton striping threads not colored by the dye.

Zambesi Black; Berlin Aniline Works, New York.

Three samples of cotton piece goods and one of cotton yarn dyed with different percentages of Zambesi Black V and 2G, for which full dyeing directions are given.

Acid Anthracene Brown G; Farbenfabriken of Elberfeld Co., New York City.

One sample of woolen yarn showing a 4 per cent. dyeing of Acid Anthracene Brown G.

Katigen Green 2B X; Farbenfabriken of Elberfeld Co., New York City.

Two samples of cotton yarn dyed with different percentages of Katigen Green 2B X.

Anthracene Chrome Black; Cassella Color Co., 182 Front St., New York City.

Six samples of slubbing dyed with different percentages of Anthracene Chrome Black. One of the samples is printed.

Katigen Indigo C L Extra; Farbenfabriken of Elberfeld Co., New York City.

Two samples of cotton yarn dyed with 2 and 10 per cent. respectively of Katigen Indigo C L Extra.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation Subscription price for the Dyers' Supplement $1.00 per year

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Recipe No. 17.

Blue on Cotton Yarn.

Diamine Fast Blue G on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Diamine Fast Blue G.
(Cassella Color Co., 182 Front St., New York.)
2 lbs. Soda Ash.
40 lbs. Glauber's Salt (Crystals).

Enter yarn at 180° F. and dye at a boil for one hour.

Diamine Fast Blue G possesses good coloring power and fastness and dyes easily level.

Recipe No. 18.

Black on Cotton Yarn.

Thiogene Black B B (Conc.) on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Thiogene Black B B (Conc.).
(H. A. Metz & Co. 122 Hudson St., New York.)
30 lbs. Sodium Sulphide (Crystals).
10 lbs. Soda Ash.
50 lbs. Common Salt.

Boil up the dye bath to insure complete solution of color then enter yarn and dye just below the boil for one hour. Squeeze well and wash immediately.

Thiogene Black B B (Conc.) is a new sulphur black which produces a bloomy blue tone and is suitable for the dyeing of all classes of cotton goods. It possesses the usual characteristics of the sulphur colors as regards fastness.

Recipe No. 19.

Blue on Cotton Yarn.

Diamine Fast Blue F F G on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Diamine Fast Blue F F G.
(Cassella Color Co., 182 Front St., New York.)
2 lbs. Soda Ash.
40 lbs. Glauber's Salt (Crystals).

Enter yarn at 180° F. and dye at a boil for one hour.

Diamine Fast Blue F F G possesses good coloring power and fastness and dyes easily level.

Recipe No. 20.

Black on Cotton Yarn.

Zambesi Black V on 100 lbs. cotton yarn. Prepare the dye bath with

5 lbs. Zambesi Black V (amount required for standing bath).
(Berlin Aniline Works, 213, 215 Water St., New York.)
60 lbs. Glauber's Salt (Crystals).
1 lb. Soda Ash.

Enter at the boil and dye at a boil for ¾ of an hour. Then rinse and diazotize by working ½ hour in a cold bath made up with

3 lbs. Sodium Nitrite.
13 lbs. Hydrochloric Acid.

Rinse again and develop by working for ½ hour in a cold bath made up with

1 lb. Toluylene Diamine.
3 lbs. Soda Ash,

then wash and dry.

Zambesi Black V yields a full bloomy black of a bluish-violet tone, which possess excellent fastness particularly to washing.

Recipe No. 21.

Scarlet on Cotton Yarn.

Direct Red 4 B (Conc.) on 100 lbs. cotton yarn. Prepare the dye bath with

1 lb. Direct Red 4 B (Conc.)
(Edwin M. Thayer & Co., 106 Broad St., Boston.)

Bring bath to the boil and add

10 lbs. Common Salt.

Enter yarn while bath is boiling and dye at a boil for one hour.

Direct Red 4 B (Conc.) possesses remarkable tinctorial power, being three times the strength of the ordinary direct cotton reds, as may be seen by the exhibited dyeing upon which only one per cent. of color was used. It will be found to be an extremely economical color as the dye bath practically exhausts.

Recipe No. 22.

Blue on Cotton Yarn.

Thionol Navy Blue X X on 100 lbs. cotton yarn. Prepare the first bath with

8 lbs. Thionol Navy Blue X X.
(Thos. Leyland & Co., 53 India St., Boston.)
20 lbs. Sodium Sulphide.
5 lbs. Sal Soda.

Dissolve the above thoroughly at a boil and then add

30 lbs. Common Salt.

Enter the yarn and dye for one hour at or just below the boil. For subsequent baths the above amounts may be reduced.

Rinse well and after treat in a bath made up with

2 lbs. Potassium Bichromate

and

2 lbs. Acetic Acid.

Rinse well and dry.

Thionol Navy Blue X X gives a deep shade of navy blue, very fast to light and cross dyeing. It is well suited to the dyeing of raw stock.

Recipe No. 23.

Brown on Cotton Yarn.

Pyrol Brown G on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Pyrol Brown G.
(C. Bischoff & Co., 88 Park Pl., New York.)
20 lbs. Sodium Sulphide Crystals.
5 lbs. Soda Ash.
50 lbs. Common Salt.

Enter yarn at 180° to 190° F. and dye just below the boil for one hour, keeping the yarn beneath the surface of the liquor as much as possible.

Pyrol Brown G gives a shade of yellow which possesses excellent fastness to light and washing.

Recipe No. 24.

Yellow on Woolen Yarn.

X L Yellow 2 R on 100 lbs. woolen yarn. Prepare the dye bath with

2 lbs. X L Yellow 2 R.
(Read Holliday & Sons, Ltd., 7 Platt St., New York.)
10 lbs. Glauber's Salt.
3 lbs. D O V.

Acetic Acid may be substituted if desired.

Enter yarn boiling and dye boiling half an hour.

X L Yellow 2 R is an excellent leveling dyeing color.

Recipe No. 25.

Green on Cotton Yarn.

Katigen Green 4 B on 100 lbs. cotton yarn. Prepare the dye bath with

15 lbs. Katigen Green 4 B.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
15 lbs. Sodium Sulphide Crystals.
6 lbs. Soda Ash.
30 lbs. Common Salt.

Boil up dye bath to insure complete solution then dye for one hour at or just below the boil.

The dye bath does not exhaust and if a standing bath is kept the amount used may be reduced for subsequent dyeings.

Katigen Green 4 B gives a bright and clear shade of green for a sulphur color, and is very fast to washing, boiling and light. Its resistance to alkalies and organic acids is also good.

Recipe No. 26.

Blue on Worsted Yarn.

Domingo Alizarine Blue G on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Domingo Alizarine Blue G.
(C. Bischoff & Co., 88 Park Pl., New York.)
10 lbs. Glauber's Salt (Crystals).
3 lbs. Acetic Acid.

Enter at 180° F., bring to a boil and dye at this temperature for ½ hour.

Then add

2½ lbs. Sulphuric Acid

and continue the dyeing ½ hour longer. When the dye bath is practically exhausted add

1½ lbs. Potassium Bichromate,

and after-treat in this bath for ½ hour at a boil.

Domingo Alizarine Blue G possesses excellent coloring power, and great fastness to light and the other common color destroying agencies.

Recipe No. 27.

Scarlet on Cotton Yarn.

Diazo Brilliant Scarlet B Extra on 100 lbs. cotton yarn. Prepare the dye bath with

3½ lbs. Diazo Brilliant Scarlet B Extra.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
20 lbs. Common Salt.

Enter yarn and dye at a boil for ¾ of an hour and ¼ hour longer after the steam is turned off.

Rinse and diazotize for ½ hour in a cold bath made up with

10 lbs. Hydrochloric Acid.
3 lbs. Sodium Nitrite.

Rinse and develop for ½ hour in a cold bath made up with

3 lbs. Developer A.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)

Wash and dry.

Diazo Brilliant Scarlet B Extra possesses good fastness to acids, washing and chloring. Its fastness to boiling and cross dyeing will suffice for most requirements.

Recipe No. 28.

Black on Cotton Yarn.

Zambesi Black 2 G on 100 lbs. cotton yarn. Prepare the dye bath with

5 lbs. Zambesi Black 2 G (amount required for standing bath).
(Berlin Aniline Works, 213, 215 Water St., New York.)
60 lbs. Glauber's Salt (Crystals).
1 lb. Soda Ash.

Enter at the boil and dye at a boil for ¾ of an hour. Then rinse and diazotize by working ½ hour in a cold bath made up with

3 lbs. Sodium Nitrite.
13 lbs. Hydrochloric Acid.

Rinse again and develop by working for ½ hour in a cold bath made up with

1 lb. Toluylene Diamine.
3 lbs. Soda Ash,

then wash well and dry.

Zambesi Black 2 G yields a jet black with a greenish tone which possesses excellent fastness, particularly to washing.

Recipe No. 29.

Blue on Cotton Yarn.

Thionol Blue 2 B on 100 lbs. cotton yarn. Prepare the dye bath with

16 lbs. Thionol Blue 2 B.
(Thomas Leyland & Co., 53 India St., Boston.)
16 lbs. Sodium Sulphide (Crystals).
80 lbs. Common Salt.
2 lbs. Glucose.
200 gals. Water.

Dye for one hour on bent sticks, keeping the yarn well under the liquor, give three turns during the hour and work gently during the rest of the period. The temperature of the dye bath should be kept well below the boiling point (150° to 180° F.).

After dyeing wring quickly and rinse at once, turning well in the first rinsing water to which a little sodium sulphide may be added. For subsequent lots only ½ to ⅔ of the amount of color given above is necessary.

Thionol Blue 2 B is exceptionally fast to light and washing and it is recommended as a substitute for indigo which it resembles in shade.

Recipe No. 30.

Black on Worsted Yarn.

Acid Black W C on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Acid Black W C.
(F. E. Atteaux & Co., 174 Purchase St., Boston.)
4 lbs. Sulphuric Acid.
15 lbs. Glauber's Salt (Crystals).

Enter yarn at 120° F., bring slowly to the boil and dye at a boil for one hour.

Acid Black W C possesses excellent fastness to light. It will not stain white cotton and is useful in dyeing of worsted goods with a white cotton thread.

Recipe No. 31.

Bronze Color on Cotton Yarn.

Direct Bronze B on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Direct Bronze B.
(Edwin M. Thayer & Co., 106 Broad St., Boston.)
20 lbs. Common Salt.

Enter yarn at a boil and dye at a boil for one hour.

Direct Bronze B is an extremely level dyeing color.

Recipe No. 32.

Blue on Cotton Yarn.

Diamine Fast Blue F F B on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Diamine Fast Blue F F B.
(Cassella Color Co., 182 Front St., New York.)
2 lbs. Soda Ash.
40 lbs. Glauber's Salt (Crystals).

Enter yarn at 180° F. and dye at a boil for one hour.

Diamine Fast Blue F F B possesses good coloring power and fastness and dyes easily level.

New York Brooklyn. A fire which started early on Wednesday morning in the engine room of factory of Julius Kayser & Co., 216-252 Grand Ave., between De Kalb and Willoughby Aves., slightly damaged the plant in which 1,100 operatives are employed on silk, lisle and cashmere gloves and silk cotton and merino underwear and hosiery.

Mill News.

COTTON.

New Mills.

*Arkansas, Mammoth Springs. Some of the machinery for the Southwestern Cotton Mills Co. at this place is en route. It is expected that the mill will be ready to start up April 15th.

*Massachusetts, Adamsdale. The Spencer Yarn Co. has been organized to operate the Adamsdale Mill, with capital stock of $50,000. Antonio Spencer is president of the new company, Geo. T. Greenhalgh, Pawtucket, treasurer, and H. Gooch, superintendent. It is expected that operations will be started in about two weeks.

*Massachusetts, Chelsea. Operations will start about Jan. 20th in the Chelsea Braiding Company's plant, making elastic cords and braids for suspenders and all kinds of cotton yarns. They will operate about 30 braiders and will sell goods direct. J. W. Wood is manager of the plant.

*Massachusetts, Taunton. Operations are expected to start in March in the new Watuppa Mill. This plant will be equipped for weaving exclusively.

New Jersey, Mt. Holly. Jno. A. Bidwell, president and treasurer of the Standard Hicks Hammock Co., has recently started up the Bidwell Towel Co. for the manufacture of bar and sponge cloths. Two new looms have just been added and they are doing a good business. The goods are sold direct at 256 Church St., New York.

*North Carolina, Greensboro. It is expected that the new plant of the White Oak Cotton Mills will be in operation during May or June. This plant will be equipped with 60,000 spindles and 2,000 looms.

*North Carolina, Roaring River. At meeting held recently by the directors of the Damask Cotton Manufacturing Company, Ira R. Hayes was elected president; R. W. S. Pegram, vice-president and W. L. Harper, secretary and treasurer. The plant is nearly completed and will be put in operation in February.

*Rhode Island, Barrington. Operations have been resumed on construction of the new lace works plant at this place. It is expected to have some of the machinery in operation in a few weeks.

South Carolina, Gaffney. The Irene Cotton Mills have been incorporated with capital stock of $50,000 by H. D. Wheat and W. G. Hays. This is undoubtedly a company formed to operate the Gaffney Carpet Co.'s mill.

*South Carolina, Spartanburg. The new plant of the Jordan Manufacturing Company, recently incorporated with capital stock of $25,000, will be located near Wellford. They will start work on new building about January 20th and expect to have plant ready to start up during May, making towels and quilts with equipment of 36 looms. C. E. Rodgers is president of the company; Wenckenfuss treasurer, and T. Hendry superintendent. Plant will be operated by water.

*South Carolina, Union. Work has begun on construction of the new building for the Lockhart Mills. This building will be 130 by 450 feet, four stories, and will have capacity of 50,000 spindles and 1,500 looms, although operations will start when half the machinery has been installed. It has not yet been decided just what class of goods will be made, in this plant to be known as Lockhart Mills No. 2.

*South Carolina, Yorkville. Thomas P. Moore is president and treasurer of the Neely Manufacturing Company, recently incorporated with capital stock of $60,000; W. R. Carroll, vice-president; and W. I. Witherspoon, secretary. Contract for the machinery, which will consist of about 3,500 spindles, has been placed. They propose having the plant running by May.

Enlargements and Improvements.

Alabama, Pell City. The Pell City Manufacturing Company has installed 40 more looms in the plant and award contract for 60 more. This will give them a total of 772 looms. They have also made some improvements to the mill.

Connecticut, Bridgeport. The Bias Narrow Fabric Company has increased the capital stock from $10,000 to $25,000. A new brick building is under construction.

*Georgia, Augusta. Work has been completed on the new addition for the John E. Smith Cotton Mfg. Co. The equipment of the plant will be increased to 6,000 spindles with 200 new looms.

Georgia, Columbus. The Eagle & Phoenix Mills will install about $40,000 worth of new machinery in the plants.

Maryland, Baltimore. Contract has been awarded for the erection of a new building, 105 by 112 feet, three stories, for the Phenix Pad Co.

Massachusetts, Fall River. The Weetamoe Mills have removed four pairs of mules in the plant and are replacing same with spinning frames.

Massachusetts, Gloucester. An addition, 30 by 70 feet, is being built to the Gloucester Net & Twine Co.'s mill.

*Massachusetts, Leominster. The United States Thread Co. has about doubled size of plant and capacity within past month. They now occupy one-half of the building formerly used by the Wachusett Shirt Co. Dressing, twisting and winding machinery has been installed.

Massachusetts, Manchaug. Additional looms are to be installed in the Manchaug Mills.

*Massachusetts, New Bedford. Work has begun installing the new machinery in the Potomska Mill.

Massachusetts, New Bedford. The Butler Mill

is reported to install 10,000 additional spindles during the year.

New Hampshire, Somersworth. The Great Falls Manufacturing Company is to make changes in some of the weaving departments. Print cloth will be made.

New Jersey, Millville. The Millville Manufacturing Company is making preparations for several improvements to the plant. The old foundry building has recently been remodeled into a storehouse for raw cotton.

New York, Kingston. The United States Lace Curtain Mills are installing new and additional machinery in the plant. New buildings will have to be erected later on to accommodate the additional machinery the company proposes installing.

North Carolina, Clayton. The capacity of the Clayton Mills is to be doubled. Work will start at an early date on the necessary addition.

*North Carolina, Fayetteville. The Holt-Williamson Manufacturing Company has completed installation of the 4,784 additional spindles, for which an addition was erected.

North Carolina, Oxford. The Oxford Cotton Mills are reported to erect an addition and add more machinery.

Pennsylvania, Scranton. At a recent meeting of the stockholders of the Scranton Lace Curtain Company a plan was proposed for refinancing the company, which is at present unable to fill orders owing to plant not being large enough. The capacity of the plant is to be increased by erect on of an additional building in the spring.

Pennsylvania, Philadelphia. The Cedar Grove Mfg. Co., 65th Ave. and 21st St., Gtn., whose establishment has been run by hand, is about to add a boiler and engine for the purpose of operating their looms in future by steam. They will also put in two more looms to enable them to keep up with the increased demand for their goods. They manufacture bar cloths and sponge cloths which they sell through their N. Y. office, 256 Church St.

Rhode Island, Pawtucket. The Royal Weaving Company is to increase the capital stock from $1,000,000 to $2,000,000 and proposes erecting another large plant at Darlington. This concern makes cotton, silk and worsted goods.

*Rhode Island, Pawtucket. The Hope Webbing Co. will install 80 new looms for narrow fabrics in their new mill started some time ago, but not completed.

Rhode Island, Pawtucket. The Jenckes Spinning Co. has recently installed additional spinning and twisting machinery, which will increase capacity about 25 per cent. The dyeing department has also been increased.

*South Carolina, Dillon. The Maple Cotton Mills will start work at once on new addition to the plant, in which 8,500 new spindles will be placed. They contemplate having same completed April 1st.

South Carolina, Newberry. The Mollohon Cotton Mills are to substitute electricity for steam as motive power in their plant.

South Carolina, Seneca. The Seneca Cotton Mills are to install a 600 electric horsepower plant in the mill.

South Carolina, Spartanburg. The Beaumont Manufacturing Company has completed a new addition, 183 by 78 feet, two stories, to the mill. They are installing about 6,000 and 150 additional looms and expect to have same in operation shortly.

Tennessee, Jackson. The Bemis Bros.' Bag Co. is to double the plant and has practically closed contract for the additional machinery.

Texas, Bonham. The Bonham Cotton Mills are to expend about $75,000 in new machinery for the plant, including erection of an additional building. They will add about 5,000 new spindles and 150 looms for making sheetings. This will about double the present plant.

Texas, Dallas. The Ajax Mills have increased the capital stock from $20,000 to $40,000.

Mills Starting Up.

*Alabama, Spigner's Station. Operations have begun in the state cotton mill, operated as the Alabama Cotton Mill, with J. A. A. W. Clark, manager. H. W. Clark is superintendent. Plant is operated on duck, sheeting and osnaburgs, and is equipped with 3,300 ring spindles and 100 looms. This mill has been idle for the past year and a half.

Mississippi, Natchez. The Natchez Cotton Mills have resumed operations.

Massachusetts, Newburyport. Preparations are being made by the Peabody Mfg. Co. to resume operations on a larger scale than for some time past.

Massachusetts, Taunton. Operations have been resumed in the Corr Cotton Mill, where operatives were recently out on strike.

Rhode Island, Crompton. Operations will be resumed Monday on a full time schedule by the Crompton Mills, which have been running on short time since last April.

Mills Shutting Down.

Quebec, Valleyfield. It is understood that portions of the Montreal Cotton Co.'s mill are to be closed down, and the preparatory departments are running out stock. This concern has recently gone into the Canadian cotton mill combination.

WOOLEN.

New Mills.

*Connecticut, Danielson. The Pequot Worsted Company, which has been incorporated with capital stock of $15,000, will manufacture worsted goods. They will install 20 new looms in the mill. Thos. E. Curry is president of the company; J. R. Davis, treasurer; C. S. Chase, agent and Frank Casey, superintendent. Goods will be sold direct and through Thos. E. Curry, New York.

Massachusetts, Lawrence. The Australian Manufacturing Company has been incorporated with

capital stock of $25,000. Edward P. Metcalf is president of the company and P. R. G. Sjostrom, treasurer. Will manufacture textiles.

*New Hampshire, North Salem. The Atlas Manufacturing Company, recently reported organized to operate the Wm. H. Hanson Mill, has been incorporated with capital stock of $150,000. J. C. Brown, of Lawrence, Mass., is president of the company; Levi Taylor, North Salem, vice president and Howard L. Gordon, treasurer. They will install 36 looms at first, increasing to 72. The project of worsted spinning is also under contemplation.

New Jersey, Passaic. The Algonquin Co. has established a shoddy plant in the buildings formerly occupied by the Dundee Woolen Co. They have installed a six set plant, for making shoddies of all grades, carded, picked and carbonized.

Oregon, Portland. The T. W. Clark Woolen Mills Company has been incorporated with capital stock of $60,000 and will erect a mill on site of the former Portland Woolen Mills. A three set plant will be installed, to be operated with two shifts.

Pennsylvania, Philadelphia. A new concern will shortly start operations here, making men's wear. Company will be known as Wright, Hall & Co. and will operate plant of 57 looms.

*Rhode Island, Bristol. The Namquit Worsted Mills have been incorporated with capital stock of $100,000 by Charles B. Rockwell, J. Harry Merrill and John G. Dobbel.

*Rhode Island, Providence. The combing and dyeing departments of the new mill for Joseph Benn & Sons has been completed and installation of the other machinery is now under way.

Enlargements and Improvements.

California, Marysville. The Marysville Woolen Mill Company has been reorganized and the capital stock will be increased to $400,000 to cover additions and improvements of the plant. Henry Malloch has been elected secretary, to succeed C. S. Brooks, resigned. Percy L. Clay is manager of the plant. Blankets of all kinds and fine flannels will be made.

Illinois, Chicago. The Western Felt Works have started erection of their new felt mill at West 40th Avenue and C. B. & C. R. R. The buildings will be of mill construction with power house outside of main building. An elevated switch will handle freight at second story. The new mill will double the size of their present plant and will be ready for operation by May 1st. Over three acres have been purchased to provide for future extension of the business, which has enjoyed a steady and healthy growth.

Indiana, Seymour. It is reported that the Seymour Woolen factory, which has been making extensive improvements to the plant during the past year, contemplates further additions during the coming year.

Maine, Camden. The Knox Woolen Company contemplates making improvements to the plant.

Maine, Dexter. An additional set (Whitin) cards has recently been installed in Amos Abbott Co.'s mill. Four new looms are to be put in shortly.

Maine, Fairfield. The American Woolen Company has recently completed installation of six new Davis & Furber mules in the Kennebec Mills besides making other improvements.

Maine, Lewiston. Two additional sets of cards and other machinery are being installed in the Lincoln Mills.

*Maine, Oldtown. The Maine Woolen Company has completed installation of two sets Davis & Furber cards and spinning.

Massachusetts, Franklin. Double cards are replacing single ones in the Norfolk Woolen Company's Red Mill.

Massachusetts, Maynard. Eight new looms have been added to equipment at the Assabet Mills.

Massachusetts, North Adams. Messrs. Waterhouse & Buffum, whose leases of the Eagle Mill expired January 1st, have made arrangements whereby they are operating 50 broad looms in the mill until February 1st, to fill contracts. The Eagle plant is running.

Massachusetts, Oakdale. Work is well under way on erection of a new boiler house for the Glen Mills, James Dorr, agent. The building is 80 by 40 feet and equipped with a 250 horsepower boiler.

Massachusetts, Pittsfield. The Pontoosuc Woolen Company's new addition has been completed.

Massachusetts, Rutland. The Standard Woolen Company is increasing the plant from a one to a two set mill.

New Hampshire, Ashuelot. The Sheridan Woolen Mills are placing improvements on the machinery in their card room.

New Hampshire, Dover. Extensive improvements are being made to the American Woolen Co.'s mill. Much of the old machinery is being removed and replaced with new.

*New Hampshire, Harrisville. As soon as the addition to the Cheshire Mills has been completed they will install new dyeing machinery.

New York, Amsterdam. The Cans Woolen Felt Mills, formerly known as the Consolidated Woolen Felt Mills, have recently installed 2 sets of English cards and one hardener. John Stansfield is manager of the plant.

New York, Utica. Two new dressing frames and six English worsted cards have recently been added to the machinery equipment of the Globe Mills, making variety of men's woolen and worsted wear.

New York, Waterloo. Plans are being figured by the Waterloo Woolen Mfg. Co. for a new brick mill, 180 by 82 feet, five stories, with picker house, 58 by 36 feet, boiler house, 57 by 70 feet and engine house 40 by 45 feet.

Ohio, Cleveland. The Cleveland Worsted Mills Co. have increased the capital stock from $800,000 to $1,500,000. New engines and electrical equipment have recently been put in and a large quan-

tity of new machinery installed during the year. A number of new looms will be installed during the summer.

Ontario, Brussels. J. T. Howe is fitting up the Howe mill property recently purchased and when completely overhauled will have a two set mill, one set knitting and one set woolen.

Oregon, North Bend. The North Bend Woolen Mills, which were reported recently as contemplating removal of plant to Sellwood, will remain at this place, where an entirely new plant will be installed.

*Pennsylvania, Landenburg. We have been advised by Mr. Lund that in addition to making improvements to mill and machinery. The size of the plant will also be increased.

Pennsylvania, Norristown. J. M. Wilson & Sons, 14 West Oak Street, manufacturers of rag carpets, art rugs, etc., on 4 hand looms, is about to engage in the manufacture of jute carpets. He is now looking for other quarters where he will install 8 looms, all of which are to be run by steam. The product of the plant is sold direct and through Philadelphia. He is buying cotton and woolen yarns from 8/2 to 4/4 and reports a good business.

Pennsylvania, Philadelphia. A permit has been granted for the erection of a one-story office building 27 by 22 feet and a repair shop 24 by 43 feet for Chas. Porter & Son, Howard and Norris Sts., as an addition to their present buildings in which they manufacture men's wear and fancy worsted dress goods on 350 looms, which they sell through N. Y.

Pennsylvania, Philadelphia. Thomas Henry & Sons have purchased the properties on the south side of Turner Street, east of Hancock, 77.8 1/2 by 234.11 feet the northwest corner of Oxford and Hancock Streets, 108.4 by 234.11 feet and the southeast and southwest sides of Waterloo and Tioga Streets, 326 by 151.5 1/2 feet for a nominal consideration subject to a ground rent of $7,250 and a mortgage for $25,000. Additions to their yarn factory will be made at an early date and the site at Waterloo and Tioga Streets will be used for that purpose.

Pennsylvania, Philadelphia. Contract has been awarded for the erection of an addition four stories for the Shackamaxon Worsted Company. Additional looms will be installed increasing output about 25 per cent. A new waste house, machine shop and boiler house will also be built. New looms, winding, warping and finishing machine y will be put in for manufacture of high grade men's wear.

Rhode Island, Olneyville. The Earnscliffe Mills Company, which has been making additions to the plant from time to time, is to erect a new mill building. Work will start on construction as soon as suitable location has been secured.

Rhode Island, Westerly. Work has been completed on a heavy foundation on which to set a large hydro-extractor in the dyehouse of the Pawcatuck Woolen Co.'s mill.

Rhode Island, Woonsocket. The Scotia Worsted Company, which has started work on an addition to the plant, will install 32 more machines, making a total of 80 when completed. Plant is operated on men's wear, dress goods and rain cloths.

Vermont, Ludlow. A 30 h. p. motor has recently been put in F. Wagan's mill, making shoddies.

Vermont, North Hartland. The Ottaquechee Woolen Company has put in 10 new Crompton & Knowles looms which are being started up.

Vermont, Saxton's River. An additional story has been built to the dye house of the Saxton's River Worsted Mill, to be used for dry room and storing purposes.

Vermont, Springfield. W. H. H. Slack & Bro. are to build a new storehouse, one story, 260 by 60 feet. The plant at Holyoke is to be removed here about February 1st.

Virginia, Winchester. The Virginia Woolen Mills, which recently resumed operations after fire of last summer are to install additional machinery in the plant. They will make some additions to the present buildings for increase.

West Virginia, Grafton. The Webster Woolen Mills Co. has been incorporated with capital stock of $25,000 to operate the Webster Woolen Mills. B. F. Sayre, A. Hoo-Phillips and John F. Phillips are among the incorporators.

Wisconsin, Chippewa Falls. The Chippewa Falls Woolen Mill has been closed for purpose of making necessary repairs and some improvements to the plant. A knitting machine department will be installed and it is proposed to have everything ready to begin operations by first of March.

Mills Starting Up.

*Maine, Waterville. The Riverview Worsted Mills are again in operation. David Stein is now superintendent of the plant, having succeeded Thomas Sampson.

*Massachusetts, Millbury. The No. 2 mill of the Mayo plant has been put in operation after a shutdown of two weeks for purpose of installing a new engine.

Massachusetts, Oxford. The Buffumsville Mill, which was remodeled for manufacturing by the late Thos. Olney, has been leased by Edward H. Burnap (Worcester) and Stillman F. Morse (Holden). They propose putting the mill in operation at once.

Minnesota, Faribault. Operations have been resumed in the Faribault Woolen Mills, which have been closed for the past few weeks.

*Oregon, Eugene. John P. Wilbur, manager of the Union Woolen Mills, Union, Ore., and William Wright, cashier of the First National Bank, Union, have purchased the plant of the Williamette Valley Woolen Manufacturing Co. and contemplate starting operations about May 1st on a line of fine all wool blankets and Indian robes and some special lines for eastern trade. This is a complete up-to-date 5 set mill erected about 3 years ago. J. P. Wilbur will have personal management of the plant.

Pennsylvania, Conshohocken. It is reported that the Old McFarland Woolen Mills at Gulf Mills, will be started up on January 1st after a year's idleness. Thomas West, of Connecticut, is the new lessee and will employ 125 hands. This mill was formerly operated on cassimeres and worsteds and had an equipment of 8 sets cards and 94 looms with dyeing and finishing department.

Mills Shutting Down.

New York, Rockwell's Mills. The woolen mill at this place is to be closed owing to the poor condition of the market. The plant is to be closed for one year at least and longer unless conditions change so that it may be reopened under more favorable prospects.

Rhode Island, Wickford. The Wickford Worsted Mill, which has started up after short idleness, will be closed after the material now on hand is worked into cloth. The property will remain closed permanently unless sold or leased.

KNIT.

For Other Knitting Mill News, see Knitting Department.

New Mills.

New York, New York. The Domestic Knitting Co., A. Greenberg and A. Frankel, proprietors, has recently started operations at 36 E. Broadway, making ladies' and men's sweaters and fancy knit goods. They operate 6 knitting and 4 sewing machines and have placed order for 5 more. They contemplate removing plant to larger quarters in the near future.

New York, New York. A plant has recently been started up by Louis Schiffer, manufacturing infants' leggin drawers and sweaters, which are made under contract. The plant is equipped with 8 knitting and 6 sewing machines.

New York, New York. Shapiro & Balacaier Bros., 201 Grand Street, are operating a plant containing 10 knitting and 10 sewing machines on sweaters and ladies' blouses. Goods are sold direct. They report business good.

New York, Stuyvesant Falls. A small knitting plant has been established here by C. L. Ashley.

Pennsylvania, Reading. Wolfinger & Sullivan is a new concern recently started here manufacturing fine hosiery, viz., cotton and lisle thread half hose. Mr. Sullivan was formerly superintendent of G. G. Guenther's plant, having held that position for six years.

Pennsylvania, Reading. The Gem Knitting Mills Co., Front and Greene Streets, is a new company organized July 1st, 1904. They manufacture fine gauge seamless hosiery. The new building which has just been completed is of four story and brick 38 by 120 feet and is equipped with all the latest modern appliances. Mr. Geiger, the president of the company, was connected with the firm of Geiger & Groff and Mr. Scarlett, the treasurer, was a member of the firm of Smith, Scarlett & Co. They expect to be in operation about the middle of January.

Pennsylvania, Reading. On December 1st, 1904, Mr. H. D. Leinbach started up in the manufacture of hosiery at Wyomissing. The mill building is three stories, of stone and concrete construction and is 30 by 50 feet. He has installed 8 Standard knitters, 8 Ruth ribbers and 2 German loopers.

Pennsylvania, Reading. Charles L. Oaks will start a new knitting plant at Spruce and Mifflin streets, where he will manufacture cotton half hose, 144 needle goods, and expects to be in operation by February 1st. He will start up with 30 Boss knitters which he expects to double in the very near future.

*Pennsylvania, Scranton. Operations have been started by the Groat Knitting Mill with a few employees getting the machinery in running order, and the entire plant will be started up January 30th.

Enlargements and Improvements.

Alabama, Huntsville. The capacity of the Rowe Knitting Mills is to be increased 50 per cent. by installation of additional machinery.

Georgia, Barnesville. The Gem Knitting Mills have purchased the plant of the Sycamore Knitting Mills, of Sycamore, Ala.

Illinois, Rockford. Operations have been resumed in the Rockford Mitten & Hosiery Company's mill which has been closed for about three weeks for making needed repairs.

Michigan, Clare. The business heretofore carried on by W. Wolsey, has been incorporated as the Clare Knitting Mills, W. Wolsey, president; L. Wolsey, vice-president, and D. A. Wolsey, secretary. Woolen hosiery and mittens are made.

Michigan, Perry. The Perry Glove & Mitten Co. is erecting a new building, 33 by 120 feet, three stories.

New York, Hoosick Falls. The Superior Manufacturing Company has purchased the hosiery mill property now occupied, with a view to enlarging it.

*New York, Syracuse. The Oak Knitting Company advise us that they are not to build a new mill but are installing some machinery at Arcade, where a building is being altered for their purpose.

New York, Utica. The Avalon Knit Wear Co. is installing a bleachery in the mill.

Ontario, Berlin. The Berlin Felt Boot Company has been incorporated with capital stock of $200,000 to manufacture felt and woolen knitted goods, etc. The incorporators are George Kumpel, O. Rumpel and H. D. McKellar. This is probably an incorporation to continue the plant of which Mr. George Rumpel has been proprietor on a large basis.

Pennsylvania, Fleetwood. Maderia & Warner, manufacturers of hosiery, are reported as contemplating erecting a new mill, or making an addition to the present plant.

Pennsylvania, Millheim. The Diamond Knitting Mills, W. A. Hoffman, proprietor, are to be removed here from Shamokin, owing to inability to secure sufficient help.

Pennsylvania, Norristown. The Home Knitting Mills of which Herman Preissler is the proprietor, is running full time on half hose of lisle and cotton, selling the goods direct. This plant operates 15 knitters, 4 ribbers and 4 loopers and will put in 8 new machines during the coming spring.

Pennsylvania, Norristown. H. T. Ballard, proprietor of the Ballard Knitting Mills, manufacturer of underwear in cotton, Egyptian and mercerized yarns, has increased the number of his knitting machines to 30 and is also turning out webbing and anklets for jean drawers for which he reports a good business. Mr. Ballard has recently purchased a plot of ground 290 by 90 feet, on which he will have erected a new three-story mill at an early date, to which he will remove when the building is finished.

Pennsylvania, Pittston. Additional machinery has been installed in the Luzerne Knitting Mill. From 25 to 30 more people are employed.

Pennsylvania, Topton. The Crown Knitting Mills, which have a present output of over 1,000 dozen pairs of hosiery a week have placed orders for twenty more of the latest improved machines.

South Carolina, Jonesville. The Jonesville Manufacturing Company is reported to make an enlargement to the plant and install 5,000 additional spindles.

Vermont, Brattleboro. The Brattleboro Manufacturing Company has installed some additional machinery for making half hose. They now manufacture infants' silk heel and toe, misses' plated and men's half hose, worsted plated, with equipment of 34 machines.

Mills Shutting Down.

New York, New York. The Hygienic Fleeced Fibre Co., 570-576 West Broadway, has discontinued business. The company failed and the machinery was sold at auction.

*New York, New York. The Empire Knitting Co.'s plant is shut down. This company passed into hands of a receiver a short time ago and it is not yet known what disposition will be made of the plant.

Pennsylvania, Norristown. Daniel Shannon, 131 Penn Street, manufacturer of women's and misses' cotton hosiery on 60 machines, is no longer in the business. He has sold his machines to the new knitting mill at Glen Riddle, Pa., where they have been removed.

Facts and Gossip.

Georgia, Dallas. W. E. Spinks and J. W. Hay are reported as interested in promoting a company to establish a knitting mill here. It is proposed to have the plant running by March 1st.

Illinois, Chicago. The Custom Knitting Works has been incorporated with capital stock of $10,000. John Nepomuck, Rosa Rauen and William Graeser are the incorporators. This probably is an incorporation of the Custom Knitting Works.

Maryland, Baltimore. J. E. Fenner (P. O. address, 638 So. Monroe St.), formerly of Rochdale, Mass., is interested in establishing a plant in the South and has others interested in the project. Before any definite decision will be made, various places will be investigated.

Massachusetts, Pittsfield. Michael Casey has been elected president of the Musgrove Knitting Co., which is shortly to remove the plant to Morningside.

Missouri, Sedalia. It is reported that the Premier Hosiery Mills contemplate removing the plant to Shenandoah, Pa., as business men from the latter place are making an effort to secure the plant.

New Jersey, Beverly. The Beverly Underwear Co., manufacturers of ladies' and children's knit shirts and pants, report a large business. The mill is now temporarily closed on account cleaning their boilers and taking account of stock, but will be started up again within a few days. They are now operating 33 knitting machines and 55 sewing machines, the officers of the company being: Alban Spooner, president; George D. McIlvaine, vice-president and treasurer, and David G. Baird, secretary. The production of this plant is sold direct.

New Jersey, Delanco. C. E. Barnitz's Star Knitting Mill, which has been shut down over the holidays, will be started up again the first week in January. Mr. Barnitz states that he has large numbers of orders on hand which must be gotten out and his machinery will be worked full time for some days to come. He operates 10 knitters on women's seamless cotton hosiery which he sells direct. He also states that it has been necessary for him to buy goods of other manufacturers to enable him to keep up with his orders.

New Jersey, Riverside. The Riverside Hosiery Mills, of which Christian Dick is the proprietor, report business as in a good condition. They are now very busy operating their 112 knitters on men's and women's seamless cotton hosiery which they dye and finish and sell direct.

New York, Brooklyn. The Progressive Knitting Works, until recently known as the Co-operative Knitting Works, manufacturers of sweaters, ladies' and misses' blouses, golf vests and fancy knit goods, reports having had a good season and is now getting ready for the coming fall and winter trade. Messrs. Rubenstein Bros. are the proprietors of the plant, equipped with 2- knitting and 5 sewing machines, both steam and hand power, at 318 Wallabout St., selling the goods direct.

New York, Brooklyn. Z. & B. Shapiro are operating the German Knitting Mills at 718 Flushing Ave., with 16 knitters, by hand, on woolen socks, stockings and bicycle hose, selling direct.

New York, Brooklyn. The Grand Knitting Works, of which Louis Schachter is the proprietor, reports a good season on his high grade sweaters, golf vests and gloves. The plant is now shut down but will be started up within a few days on his fall samples. He operates 10 knitters and 2 sewing machines.

New York, Brooklyn. Julius Muller, 132 Melrose Street, who has been doing contract work for the Crescent Co., New York, at the above address for thirteen years, will sever connections with the

above firm February 1st and will make same class of goods as heretofore, selling same direct.

*New York, Hoosick Falls. The Superior Manufacturing Co. has purchased the mill property formerly owned by the Hoosick Falls Hosiery Co. with the intention of utilizing it later as an addition to their own plant. They were erroneously reported as now occupying same.

New York, New York. The Harvard Knitting Mills have been incorporated with capital stock of $20,000 by S. Blumenthal, A. Sternan and Joseph Plant.

New York New York. The Westside Knitting Mills, whose plant at Washington and 13th Streets was damaged by fire, has removed to 422 West 14th Street. They are capitalized at $25,000 and operate 50 knitting and 75 sewing machines on ladies' and children's cotton ribbed underwear, heavy weights, sold through Critten, Clift & Co., N. Y. W. F. Ritter is treasurer and buyer of the concern and reports a good season with plant busily engaged.

New York, Niagara Falls. The Visor Knitting Mills have been incorporated to manufacture knit goods. Capital stock is placed at $40,000. Bernard Rautenberg, Patrick F. King and Frederick J. Brown are interested.

New York, Troy. The Barnet Textile Company has been incorporated to manufacture stockinette cloth. It is stated that parties interested in the Commercial Knitting Mills Co. are also interested in the new enterprise.

North Carolina, Albemarle. It is reported that a new mill is to be built for the Wiscassett Mills Co. and that they propose having same in operation by middle of summer.

*North Carolina, Cornelius. R. J. Stough, J. B. Cornelius and F. C. Sherrill are interested in organization of company with capital stock of $30,000 to equip and operate a knitting mill.

North Carolina, Coats. J. T. Coats of this place is reported as interested in locating a knitting mill at this place and is offering a free site to manufacturers.

North Carolina, Durham. The Stone Hosiery Company has been organized with capital stock of $50,000 for operating a hosiery plant. N. W. Greenfield, J. H. Stone and W. F. Barbee are interested.

North Carolina, Randleman. The Pearl Hosiery Manufacturing Co. has been incorporated with capital stock of $25,000, to operate plant of same name.

Pennsylvania, Adamstown. The Blue Grass Knitting Mills which recently started operations in Reading have removed to this town.

Pennsylvania, Birdsboro. Charles Beyer, Norristown, has purchased the machinery, etc., of the hosiery mills of the William Cavanaugh estate. The plant will be continued by new proprietor at old location.

Pennsylvania, Bridgeport. The Kaufman Manufacturing Co., manufacturers of children's and misses' ribbed seamless cotton hose on 144 latch needle machines is doing a good business. They report that Harry M. Gale, superintendenet of the plant, is no longer connected with them and that a new superintendent will take charge within a few days. They sell direct.

*Pennsylvania, Lititz. The Keystone Underwear Co., recently reported incorporated with capital stock of $75,000, is an incorporation to continue the plant formerly run as the Keystone Underwear Mills.

SILK.

New Mills.

New Jersey, Paterson. The Bohl Silk Dyeing Company has been incorporated with capital stock of $100,000.

Enlargements and Improvements.

Connecticut, Bridgeport. A one story addition, 60 by 70 feet, is to be built for the Salts Textile Company. They will use same for weave room and storage.

Connecticut, South Manchester. Sixty additional looms are to be installed in the velvet department of the Cheney Bros. mill. The number of employees will also be increased.

*Maryland, Hagerstown. Work has been about completed on the new building for the Hagerstown Silk Co.

MISCELLANEOUS.

New Mills.

New Hampshire, Meredith. The Atlas Linen Company is to add some new machinery.

New York, Brooklyn. A dyeing and finishing establishment is run by Wm. Meister at 56 N. Front St. He makes a specialty of ribbons and also dyes raw stock and redyes. Business with him is good.

Pennsylvania, Philadelphia. P. F. Flynn, for the last ten years in charge of the bleaching department of Jas. B. Ward & Bro., Howard St. and Lehigh Ave., and Thomas R. Deavy, under the name of Flynn & Deavy, have leased the old Barrett Bleachery at Factory and Adams Sts., Frankford, in which they are bleaching cotton, woolen and linen fabrics and hosiery and knit goods. The plant now in operation has a capacity of 2,000 pounds per day which will be greatly increased. It is the intention of the new firm to make extensive improvements in the buildings and put in new boilers, etc.

Rhode Island, Pawtucket. The Harrison Yarn & Dyeing Co. has started work on the erection of a large building to be used as a storage shed.

Enlargements and Improvements.

Massachusetts, Danvers. An additional story, 150 by 55 feet, is being added to the Danvers Bleachery & Dye Works.

New Jersey, Paterson. Contracts have been awarded for a new engine and electric generator to

be installed in the Barbour Flax Spinning Company's mill, to furnish additional power for driving machines and electric illumination.

New York, Brooklyn. The Lawrence Cordage Works, now located at Waterbury and Ten Eyck Sts., is to be removed to a building on Communipaw Ave., Jersey City, N. J. They also state that the name of the establishment, the main office, however, being retained at 46 South St., New York City.

North Carolina, Spray. The American Warehouse Company has made arrangements for some additional finishing machinery to be installed in the plant.

Pennsylvania, Philadelphia. Contract has been awarded Cramp & Co. to erect a temporary dye house for the Fidelity Finishing Works, at Mascher and Turner Streets. The building of a large permanent building is in contemplation for the near future.

FAILURES AND SUSPENSIONS.

Georgia, Atlanta. The Atlanta Cotton Mills have been placed in the hands or a receiver on petition of the United States Mortgage and Trust Co. of New York. Henry E. Fischer has been appointed receiver.

Massachusetts, Fall River. The tangle at the Davis Mills is still in process of unraveling and many legal actions are likely to be brought. Judge Lowell of the United States Circuit Court has appointed Daniel F. Slade, James M. Morton and John T. Bodge receivers and trustees for the large quantity of cotton, the title to which is in dispute.

Massachusetts, Fall River. The pending difficulties of the Davis Mill have at last reached a climax and a receiver has been appointed and upon application of some of the creditors, with stockholders' consent, the U. S. Circuit Court appointed J. P. Bodge and Edward Barker of Fall River and R. M. Saltonstall of Boston receivers. This is a new mill, having been organized in 1903. J. Bion Richards was promoter and treasurer. At a meeting of Board of Directors December 23d, the resignation of Mr. Richards as treasurer was accepted and Edward Barker was elected to succeed him. It is understood that the company has never had sufficient capital from the start and was a heavy borrower, and the strike and losses in cotton have contributed to its difficulties. A short time ago a mortgage was given to secure an issue of $500,000 bonds, but these have not been sold to any extent. It is a 50,000 spindle mill, with about 1,000 looms, and equipped for fine goods. Quick assets are stated to be $537,836, with liabilities of over $1,000,000. There have been some complications in regard to mortgage and liens on cotton.

Massachusetts, North Adams. A petition in bankruptcy has been filed against the Windsor Print Works. The concern is understood to have been in straightened circumstances for some time past. Robert C. Morris has been appointed receiver in New York, with David A. Russell and F. C. McDuffie, the latter treasurer of the York and Everett Mills, ancillary receivers in Massachusetts. Liabilities are stated to be $509,610, together with mortgages on the plant. The amount of the assets has not yet been given out. The plant is closed down and 400 to 500 people are out of employment. This plant was formerly the Freeman Print Works.

*Massachusetts, Uxbridge. Frank C. Smith, Jr., has been appointed receiver of the Royal Woolen Company, which recently filed a petition in bankruptcy.

New Jersey, Paterson. John Brown, operating a warping and winding business under name of Brown & Hargrove, has made an assignment to Henry Bewkes, Jr. No statement has yet been made of assets and liabilities.

New York, Troy. William Denison, formerly of Newland, Denison & Co., manufacturers of knit goods at Stillwater, and John Pack, former superintendent of the Saratoga Knitting Company, have filed petitions in bankruptcy, owing to the fire and liquidation of the Saratoga Knitting Company last summer. Mr. Denison's liabilities are placed at $49,190 and Mr. Pack's, $5,000.

Pennsylvania, Bloomsburg. The Bloomsburg Woolen Mills, E. C. Caswell & Co., proprietors, have been damaged by fire. The loss placed at $100,000, is partly covered by insurance.

Pennsylvania, Harrisburg. The Harrisburg Woolen Co.'s mill has been placed in the hands of a receiver.

Pennsylvania, Philadelphia. The United States district Court has appointed Richard Campion receiver of the assets of the Clifton Mills Co., manufacturers of men's wear, worsted suitings and piece dyes on 60 looms, located at the corner of Hancock and Turner Streets. George F. Jackson, H. Rudolph Sack and Eugene W. Goodman were appointed appraisers.

FIRES.

Massachusetts, Dalton. Crane Bros. towel mill has been totally destroyed by fire. It is reported that they may rebuild in the spring. The loss is placed at about $4,000 on building and contents.

Massachusetts, Spencer. Dufton Bros.' satinet mill has been totally destroyed by fire. The loss is placed at about $25,000, with no insurance. It is reported that the owners have not yet decided about rebuilding.

Pennsylvania, Reading. The Prospect Dye Works plant has been damaged by fire. The second and third floors are completly ruined. Work will start rebuilding as soon as insurance is adjusted.

FACTS AND GOSSIP.

Alabama, Birmingham. It is reported that Joseph B. Babb, secretary of the Commercial Club, is making an effort to start up the plant formerly run by the Birmingham Cotton Mfg. Co. This plant is equipped with 5,000 spindles and has been closed for several years owing to dissension and mismanagement.

Alabama, Cullman. The project of establishing

a cotton mill is again being agitated and T. W. Pratt of Huntsville is mentioned as interested.

Alabama, Leeds. J. W. Elliott is reported as making an effort to locate a cotton mill here.

*Alabama Leeds. J. W. Templeman, 74 N. Broad Street, advises us that details have not yet been perfected regarding proposed mill.

*Arkansas, Harrison. We have been advised by Jno. A. Bunch that plans for the proposed mill have not fully matured. They propose a one set woolen mill of about 48 or 60 inch cards. They are desirous, however, of obtaining outside capital, of a few thousand dollars, if possible, and are desirous of corresponding with parties who might be interested.

Connecticut, Middletown. The Merchants' Silk Company has been incorporated with capital stock of $200,000.

*Connecticut, Norwich. The Reliance Worsted Company's plant at this place is now fully equipped and in operation. There are 8 sets of cards and 50 broad looms on worsted goods exclusively.

*Connecticut, Norwich. Work has been started removing the machinery from M. J. Green's mill at Paterson, N. J., to new building erected here. It is thought that the plant will be in operation early in February.

Connecticut, Windsor Locks. The J. R. Montgomery Co. is having their system of humidifiers extended, the work being done by the American Moistening Company, of Boston, Mass.

Georgia, Augusta. It is reported that the Isaetta Mill, which has been sold, will be converted into a plant for manufacturing fine cottons. The plant, which has been idle for some time, was purchased by Fall River parties, who propose equipping same for making the finer class of goods.

*Maine, Camden. Samuel Williams is president of the Seabright Woven Felt Co., which succeeds the Megunticook Woolen Co., Frank E. Paige, treasurer and Richard Howarth, superintendent. Woven and mechanical felts are made and sold direct.

Maine, Lewiston. The Bates Manufacturing Company is having a system of humidifiers installed by the American Moistening Company, Boston, Mass.

Maine, Readfield. It is reported that a Waterville firm contemplates purchasing the Nawoc Mill property.

Massachusetts, Fitchburg. The Fitchburg Duck Mills have been incorporated to operate the plant running under above name, with capital stock of $100,000. Harriet F. Nevins is president of the company and Thomas C. Sheldon, treasurer.

*Massachusetts, Fitchburg. Work has been completed removing the machinery of the Shirreff's Worsted Company from their plant at North Chelmsford to this place. It is expected that operations will be started in full about February 1st.

Massachusetts, Franklin. A night and day force is employed at the Franklin Yarn Company's mill.

*Massachusetts, North Chelmsford. Work is rushing at the scouring plant recently completed by George C. Moore.

*Massachusetts, South Hadley Falls. The Hadley Mills Company has about 300 looms now in operation out of a total of 700 in the plant.

*Massachusetts, Westville. The Westville Spinning Company has started operations in their plant under management of H. S. Culver. As soon as weather permits a new cotton house will be built.

Minnesota, Mankato. The Midland Knit Goods Co. has been formed to conduct a wholesale business in knit goods of all kinds, including hosiery and underwear, in cotton and woolen. Later on it is stated, they propose manufacturing knit goods. John A. Farmer and Charles F. Foru, the former traveling salesman and the latter formerly superintendent in the Mankato Mills, comprise the firm.

Nevada, Reno. It is reported that a company is being organized at this place to establish plant with capital of $100,000 to manufacture woolen goods. Wealthy sheep owners are interested.

New Hampshire, Gilsum. John S. Collins & Co. are now operating their mill on fancy shirtings, suitings and rain cloths. They have recently put in some new machinery.

New Hampshire, Nashua. A small building has been erected by the Nashua Manufacturing Company to cover a recently installed wheel and machinery of the power tower.

New Jersey, Beverly. The Archibald C. MacElroy Mfg. Co. is running full time on bedspreads, curtains and table cloths which they weave up on 26 looms doing their own dyeing and bleaching and sell direct. Mr. A. C. MacElroy, Jr., is the superintendent.

New Jersey, Jersey City. The G. W. Ellis Co. has been incorporated with capital stock of $75,000, for purpose of manufacturing silks. A. A. Brewster, of Montclair, is mentioned as interested.

New Jersey, Paterson. The Harris Bros. Silk Company, recently incorporated, will continue business formerly run by William Harris. Company manufactures ribbons. William Harris is president of the company and treasurer and Joseph Harris, superintendent. Goods are sold through Wm. Iselin & Co. Operate 10 looms and 150 spindles.

New York, Brooklyn. The silk mill of Jno. N. Stearns & Co., 171 Wallabout St., where they operate 200 looms on broad silks, is running full time. The superintendent is Gustave A. Hurlimann who also does the buying for this mill.

*New York, Canisteo. C. M. Crandall advises us that he is interested only in a company formed to raise money for purpose of purchasing a site and erecting a building to be used for a silk mill. He will have nothing to do with management of the plant.

*New York Canisteo. The Huguet-Merrill Company has not yet made any definite decision regarding establishment of branch mill at this place.

New York, Delhi. It is reported that Messrs. Gallant have interested other capital in the plant and that the company will probably be reorganized.

New York, East Salem. The woolen mill property of C. P. Hatch has been purchased by J. E. Ashworth & Sons of Brookville. Possession will be taken April 1st, when the plant will be running on fine horse blankets.

New York, Gouverneur. It is reported that J. Henry Abbott, who recently purchased the buildings formerly occupied by the defunct Gouverneur Machine Company, contemplates establishing a woolen mill there.

*New York, Gouverneur. The International Lace Manufacturing Co., which has a capital of $250,000 preferred and $250,000 common stock, employs about 220 people. They make Nottingham lace curtains, ruffled lace curtains and bed sets. J. S. Lesser is president of the company and Morris Lesser, treasurer.

New York, New York. The American Tie Silk Association has been incorporated with Joseph L. Reiling (New York), Wm. A. Lord (Plainfield), Allen C. Ashley (Paterson), Edward G. Hagadorne (Brooklyn), directors, for the purpose of fostering interests of those interested in importing and manufacturing tie silks.

New York, New York. The firm of Holley & O'Callaghan, selling agents for hosiery, gloves, etc., 54 Worth Street, has been changed to O'Callaghan & Fedden.

New York, New York. The Manhattan Backing Co., whose main office and factory is at Jersey City, with branch at 140 Sullivan Street, has changed name of firm to the Manhattan Manufacturing Co.

North Carolina, Kernersville. Geo. M. Crews has purchased the Southern Woolen Mills at public auction, for $2,450. It is not yet known what will be done with the plant.

North Carolina, Selma. Efforts are being made to organize a company to manufacture cotton duck for covering bales of raw cotton. It is reported that $175,000 has been subscribed toward the proposed capital of $300,000.

*North Carolina, Selma. M. C. Winston, president of the Bank of Selma, is actively interested in endeavoring to ensure success of proposition for organizing a cotton mill company to manufacture cotton duck for covering cotton bales and making fertilizer bags. It is proposed to have an equipment of 15,000 spindles with complement of looms. Mr. Winston contemplates starting construction work by April 1st. A meeting will be held shortly to perfect plans.

North Carolina, Spray. The German-American Company has been incorporated for purpose of manufacturing and dyeing cotton and woolen fabrics, etc. The capital stock is placed at $500,000, of which $400,000 will be issued in preferred stock. Messrs. William Schaenhert and B. Frank Mebane are interested.

*Ohio, Tiffin. We have been advised that the deal regarding starting up of the Tiffin Woolen Mills, has not been consummated and the prospects of starting are still distant.

Oregon, Pendleton. The Pendleton Woolen Mills have been leased by Charles J. Ferguson, who is operating same on Indian robes, shawls, blankets, etc. This plant is equipped with 2 sets cards and 11 looms.

Pennsylvania, Chester. The Standard Spinning Co.'s plant, which has been idle for some time, has been purchased at public sale by Samuel J. Cochran. It is thought that Mr. Cochran represents the Lincoln Manufacturing Co., of which T. Ashby Blythe is president.

Pennsylvania, Duryea. The Dutton Silk Co. will soon be operated with a day and night force.

Pennsylvania, Easton. The Stewart Silk Company is extending their system of humidifiers installed by the American Moistening Company of Boston, Mass.

*Pennsylvania, Gouglersville. The report that a new mill is to be established here by Messrs. Worley & Geiger is erroneous.

Pennsylvania, Mohrsville. James H. Wagner & Co., manufacturing underwear, are operating their plant overtime.

Pennsylvania, Philadelphia. S. Feather & Co., spinners of worsted yarn at Franklin St. and Girard Ave., have sold their plant.

Pennsylvania, Philadelphia. Frank Reichenbach of Philadelphia is no longer the agent for the Grosser Knitting Machine Co. All manufacturers in Philadelphia and the State of Pennsylvania who have business with this concern are requested for the present to write directly to the New York office, 260 West Broadway, for information about the Grosser machines.

Pennsylvania, Philadelphia. An announcement has been made of the fact that the firm of Charles H. Witty & Co. has been dissolved by mutual consent, Mr. Gustav Rumpf retiring from the firm. The business will be carried on in the future by Mr. Charles H. Witty under the old name. This company operates 165 looms on damasks, quilts, table covers, etc., at Huntingdon and Hancock Sts., which they dye and sell direct.

Pennsylvania, Philadelphia. Estimates have been taken the past week for the new foundry to be built by the Crompton & Knowles Loom Works, 17th and Glenwood Avenue. It will be a brick building, one story and basement, about 87 by 110.

*Pennsylvania, Philadelphia. Hugh J. Hamill is president of the Hamill Spinning Company recently organized to operate plant formerly run by Hamill & Co.; W. Howard Holden, vice president; John Meighan, treasurer; Roger B. Curtis, assistant treasurer and John B. Hamill, secretary.

Pennsylvania, Philadelphia. The Hamill Spinning Company has been incorporated with capital stock of $100,000. Company will probably operate plant run by Hamill & Co. on yarn.

Pennsylvania, Philadelphia. William F. Read & Sons Company has been organized to operate the plant formerly run by Wm. F. Read. This plant is run on fine line silk warp dress goods, including henriettas and other special grades.

Personals.

Cotton.

O. W. Stiles is the new superintendent at the Louisville Cotton Co., Louisville, Ky. Mr. Stiles comes from Hamilton, Ont.

G. E. Sink has been appointed overseer of weaving for the Gibson Cotton Mill, Concord, N. C., succeeding A. J. Thompson.

The Carolina Mills, Greenville, S. C., have placed an order with the American Moistening Company, Boston, Mass., for the complete equipment of their mill with humidifiers.

William L. Abare, overseer of weaving rooms Nos. 1 and 2 of the Nashua (N. H.) Manufacturing Company, has handed in his resignation, to take effect April 1.

The Everett Mills, Lawrence, Mass., are extending their system of humidifiers installed by the American Moistening Company.

Allis Culberson, who has been assistant superintendent at the Gaffney, S. C., cotton mills, has gone to Liberty to take charge of the mills of the Calumet Mfg. Co.

Andrew A. Tracy, overseer of weaving for the J. D. Clark Company, Rochdale, Mass., has resigned, after 15 years' service.

The Burt Manufacturing Co., Akron, O., are doing a rushing business. They have just shipped one 20-inch exhaust head to the Crane Co., Chicago, and another of the same size to the large power house at San Jose, Cal., also one of their large Cross oil filters to the United States Coal & Coke Co. for use in their mines in West Virginia.

The Great Falls Mfg. Co., Rockingham, N. C., are now erecting in their mill a number of revolving flat cards recently ordered by them with the Howard & Bullough American Machine Co., Pawtucket, R. I.

Arthur H. Mason has resigned as treasurer of the Barnaby Mfg. Co., Fall River, Mass. Frederick W. Harley, who has been superintendent of the mill, has been elected to succeed him.

A. H. Gullivar, formerly superintendent of the No. 4 and Ashton Mills of the Lonsdale Company, has been appointed to succeed Charles E. Dexter, who resigned the superintendency of the Samoset Mills, Valley Falls, R. I.

J. E. Stanton, who has been selling agent for New England Cotton Yarn Co., with headquarters in New York, has resigned. Mr. Walter C. Baylies of the firm of Amory, Brown & Co., and one of the directors of the New England Cotton Yarn Co., will have charge of the selling end of the business in future. The headquarters will be at 141 Milk street, Boston, the clerical force of the selling end having been removed from New York to Boston. Mr. Baylies, together with Mr. Sharp, the general manager, and Mr. Minot C. Weld, the president of the company, will form sort of an executive committee with direct supervision of the sales. It is understood that Mr. Baylies still retains his connection with Amory, Brown & Co.

Woolen.

William E. Lyford, who has held the position of superintendent of the Higgins Carpet Manufacturing plant at New York, has been appointed superintendent of the Hartford Carpet Corporation at Thompsonville, Conn.

Thomas Munn, formerly of Jamestown, N. Y., has succeeded Abram Greaves as manager of the worsted department of the Riverside Mills, Providence, R. I. Mr. Greaves has been connected with the mill thirteen years.

H. K. Martin has resigned as assistant overseer in the Brussels department of the Hartford Carpet corporation, Thompsonville, Conn., and accepted a position as superintendent of a carpet mill in Auburn, Mass.

E. H. Witt of Holyoke, Mass., succeeds William A. Theinert, resigned, as overseer of spinning, spooling and twisting for the Webster Woolen Company, Sabattus, Me.

Miles Collins, assistant superintendent of the yarn department of the Atlantic Mills, Providence, R. I., has severed his connection with the company.

Walter Davis has been appointed designer at the new Concord Woolen Mill, Concord Junction, Mass.

The Burt Manufacturing Co., Akron, O., has just shipped one of their large Cross oil filters to the Munising Paper Co., Munising, Mich., and another to the Singer Sewing Machine Co. Both of these filters will be used in connection with the Seigrist oiling system.

James Wilson, boss dyer for the Weybosset Mills, Providence, R. I., has been engaged as boss dyer for the American Felt Co., Glenville, Conn.

B. J. Cullinan, superintendent at the Black River Woolen Mill, Ludlow, Vt., has resigned, and returned to Lowell, Mass.

Abram Greaves has been retired from the management of the worsted department of the Riverside Mills, Olneyville, R. I. Mr. Greaves had been in the mill for the past 13 years. His position is filled by a Philadelphia man.

David Dwyer, lately associated with the Garfield (N. J.) Woolen Co., as superintendent of the shoddy department, has taken a similar position with the Algonquin Co., Passaic, N. Y.

Thomas Elward has resigned as boss dyer for Davis & Brown, Killingly, Conn., where he has been for four years.

Robert McMahon, Jr., for many years with the Laurel Hill Yarn Co., Bridgeton, R. I., is now manager for Thayer & McMahon, manufacturers of woolen and merino yarns, Washington, R. I.

Clarence A. Williamson, overseer of the wet finishing at the Ray Mills, Franklin, Mass., has resigned. He is to take charge of the finishing department of the Hayward Mills, East Douglas, Mass.

Silk.

S. L. Burlingham, superintendent of the Holland Mfg. Co., silk, Willimantic, Conn., has resigned. The overseers and male help at the mills presented him with a dress suit case.

Messrs. Cheney Brothers, South Manchester, Conn., have placed a repeat order for humidifiers with the American Moistening Company, Boston, Mass.

Charles W. Alpaugh of Willimantic, Conn., has been promoted superintendent and agent of the Holland Silk Mills, at Willimantic. He is the successor of Samuel Burlingham. Mr. Alpaugh has been employed at the mills for the past twenty-nine years, working up through the various departments, and has been for many years superintendent of the finishing department.

L. D. Crawford, who has been with Hammond-Knowlton & Co., of Putnam, Conn., during the past ten years, has accepted a position as bookkeeper for the Holland Mfg. Co. of Willimantic, Conn.

W. I. Crane has become superintendent of the finishing department of the Holland Silk Mills, Willimantic, Conn., succeeding C. W. Albaugh, and Fred Mott takes Mr. Crane's place in the mills.

Miscellaneous.

The Burt Manufacturing Co., Akron, O., have just made a shipment of 21 of their oil filters to their agency at Havana, Cuba. They report that according to present conditions Cuba will afford a very profitable field for American manufacturers. They have also worked up an extensive export trade in many other countries, and have recently made a shipment of 9 oil filters and 6 exhaust heads to their agency at Sydney, Australia, 18 oil filters to their agency at St. Petersburg, Russia, 3 oil filters to their agency at Calcutta, India, 4 oil filters to Spain, and 2 20-inch exhaust heads to London, England. These facts verify the merits of the Burt Manufacturing Co.'s output as well as demonstrating how widely American manufacturers are recognized.

John S. Canavan has begun his new duties as foreman of the engraving room at the Cranston Print Works, Cranston, R. I.

Roscoe L. Chase, who has been connected with the Arnold Print Works at North Adams, Mass, in various capacities since 1890, is in full management of the print works. He has been assistant manager for the past five years, and this latter position is now filled by Arnold L. Bossi.

Deaths.

William Dobson, Waterville, Me., died January 15. Although he had been gradually failing for six or eight months news of his death was a shock to his wide circle of friends and acquaintances. Mr. Dobson was born in Scotland in 1845 and all his life was engaged in the manufacture of woolens. When his father, the late Robert Dobson, after a long experience abroad, started in business for himself, his son William was his righthand man from the start and it was but natural that the business should be conducted by a partnership of father and son. Mr. Dobson was a director in the Waverly Woolen Mills in Pittsfield, Maine, also. Outside of business his connections were wide. In politics he had been prominent, and at one time he was vice-president of the Home Market Club of Boston. He is survived by two daughters and one brother, Gordon Dobson, his partner in the Pioneer Mills.

John Edwin Rollings, 52, over 20 years a resident of Springfield, Mass., died Jan. 9th after a short illness. Mr. Rollings was a carpet designer and colorist for the Hartford Carpet Company, Thompsonville.

John McArthur, who owned and operated the Ford Woolen Mills, Norristown, Pa., for many years, died December 30th. He was 79 years old.

Thomas Hampson, a well known and highly respected citizen of Anniston, Ala., and superintendent of the cotton mills at the Anniston Mfg. Co., died December 31st. He had been connected with these mills for the past twenty years.

C. B. Miller Sprowles, president of the Standard Machine Company, Philadelphia, died at his home in Frankford, December 26th, after an illness of six months. Mr. Sprowles was born in July, 1849, received a fair common school education and served an apprenticeship at the machine trade and tool making. Becoming very proficient at this trade, being an expert at tool making, he went into the machinery business in partnership with his cousin, John Miller, and at his death formed the partnership of Sprowles & Houseman, which continued until the death of Mr. Houseman. This concern were in the machine manufacturing business in a general way until the inventions of H. A. Houseman gave to the hosiery manufacturers the Standard automatic knitter, and from that time Mr. Sprowles became prominently identified with the knitting interests throughout this country and abroad. It was principally through his efforts that the Standard Machine Company was formed, and shortly after the death of his partner, Mr. Houseman, he closed out his interests in the firm of Sprowles & Houseman, and devoted his entire attention toward promoting the welfare of this company. He was well and favorably known to all of the prominent hosiery manufacturers in this country, and his family life was ideal. Three sons and four daughters, besides his wife, survive him.

John Owen, a retired woolen manufacturer, for many years in partnership with Albert Sayles under the firm name of Sayles & Owen, with mills at Warren, R. I., died January 7 at his home in Chepachet, R. I., aged 83 years.

William T. Burrow, agent and superintendent of the Glenlyon Dye Works, Saylesville, R. I., for 22 years, died recently, at the age of 66 years. He was born in Leeds, Eng., and before coming to this country in 1880 had been manager of large dyeing and finishing plants in England. His first connection in this country was with the New York Dyeing & Printing Co. In 1882 he took charge of the finishing and dyeing departments of the Arlington Mills, Lawrence, and a year later went to the Glenlyon.

J. Russell Greenwood, superintendent of the Mayo Woolen Mill No. 2, Millbury, Mass., died at the Worcester City Hospital recently from blood poisoning, resulting from cutting his foot with an axe. He was 20 years of age, and born in Dexter, Me. His father, John R. Greenwood, is superintendent of No. 1 mill. Mr. Greenwood had a wide circle of friends.

George E. Kent, agent and treasurer of the Exeter Manufacturing Co., Exeter, N. H., and owner of the leased mills at Pittsfield, died January 26, after a four months' illness. Mr. Kent succeeded his father as agent and treasurer of the mills in 1895. His death is a marked loss to Exeter and Pittsfield.

John H. Worster of J. H. Worster & Sons, who operate the Rising Sun Knitting Mills, Philadelphia, Pa., died January 18. Mr. Worster was born in England in 1842. When a youth he came to this country, and after spending several years in the South came to Philadelphia. For some years he was engaged in the butcher business, and subsequently engaged in the manufacture of hosiery with his sons, William and Edward. He was a promoter of the Excelsior Trust Company, a director of the Consolidated Ice Company and of the West Allegheny Building & Loan Association. He assisted in organizing the Eden Methodist Episcopal Church, and was president of the Board of Trustees. A widow and three sons survive him. The business will be continued as heretofore at the same place.

William Scott, a member of the firm of William Wood & Co., textile manufacturers, Philadelphia, Pa., died January 20.

Henry Grant of Henry Grant & Sons, manufacturers of woolen and merino yarns, Philadelphia, Pa., died January 19.

William Harley died January 15th. He came to this country from Scotland in 1854 and became superintendent of the Hamilton Woolen Company's print works at Southbridge. After 16 years as superintendent of the Hamilton Manufacturing Co.'s print works at Lowell, he and his brother started a small print works of their own. He then went to the Allen Print Works in Providence, as superintendent, and still later to the Richmond Mfg. Co. in Providence as superintendent, retiring when this latter company went out of business.

Thomas Hampson, for 24 years superintendent of the Anniston (Ala.) Cotton Mills, died in that city recently.

David Boyle, overseer of dyeing at the Peck Manufacturing Company, Pittsfield, Mass., for the past seven years, died at his home in that city recently.

Loyis Fafford, superintendent of the Uxbridge Cotton Mills, Whitinsville, Mass., died at his home January 16th from pneumonia. Mr. Fafford was born in Canada and came to the United States when a young man.

Joseph M. Wade, for 35 years of his life connected with the woolen industries of this country as a weaver, designer, superintendent and agent, and in later years widely known as the publisher of Wade's Fibre & Fabric, died at his home in Dorchester on January 22, at the age of 72 years. Mr. Wade was born in England and came to this country at an early age.

He first went to work in the old Bay State Mills at Lawrence, Mass., and often used to tell how he went in with one of the weavers and after watching them during the forenoon asked to be given a loom for himself in the afternoon, and ran it without further assistance for six months afterwards, during which time he learned everything there was to learn about a loom and chain building and loom fixing.

Being naturally of an investigating and restless disposition, he moved from place to place, gaining what knowledge he could in each mill and moving on, till he soon became a designer. He was superintendent of the Waterford Mills at Blackstone, Mass., during the war times, also of the large mill at Camden, N. J., and when only 32 years old was appointed manufacturing agent of the American Mills at Rockville. It was while he was in this position that he first became interested in publishing, and in his leisure time he started a paper devoted to pigeons and birds, called The Fanciers' Journal, and at subsequent periods was interested in other publications pertaining to natural history. On leaving Rockville he engaged in woolen manufacturing on his own account under the firm name of Wade & Farnum, but this venture proved unsuccessful. Afterwards he was in Philadelphia in the agricultural implement business.

In the early eighties, Thomas Pray, Jr., then editor of Boston Journal of Commerce, induced Mr. Wade to take charge of the woolen department of that publication, and shortly after when Mr. Pray resigned, Mr. Wade became editor-in-chief, a position he retained for several years, leaving to become associated with Charles S. Miller under the firm name of Wade & Miller as wool brokers. It was at this time that Mr. Wade conceived the idea of the Overseers' Bureau, which proved a success from the start. Soon after, in March, 1885, Wade's Fibre & Fabric was started. The firm of Wade & Miller was dissolved at this time and Henry G. Lord was taken into partnership under the name of Joseph M. Wade & Co., under which name the business was continued for many years, Mr. Lord selling his half interest to Mr. Wade in 1887 to establish the Textile World.

Mr. Wade was an indefatigable worker, always being at his desk before 8 o'clock in the morning and seldom leaving till after 5 at night. In the early years of the paper he seldom failed to return to the office in the evening and usually on Sundays and holidays.

For the past few years he has been in failing health, and last summer retired from business, having sold out his interests in Fibre & Fabric.

In later years he was much interested in matters pertaining to occultism. He was a warm friend and helper of the Japanese in this country, and in appreciation of his interest and friendship in them was honored by the Mikado with the unique distinction of the "Order of the Rising Sun," said to be the only order of the kind ever bestowed upon an American.

Mr. Wade was a man of strong individuality and prided himself on his eccentricities and his uniqueness. With little school education, he had the natural ability of writing clearly, concisely and sharply and with the human interest which made his an interesting character. He was as widely known as any man in the trade, and will be missed by a large circle of friends and acquaintances, many of whom he had helped to higher positions.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

Cyclopedia of Applied Electricity; 5 volumes, 2,500 pages, 8 by 10 inches. 3/4 morocco. American School of Correspondence at Armour Institute of Technology, Chicago. Price, $18.00

This work, containing over 3,000 illustrations, has been designed as a practical guide for electricians, engineers, telephone and telegraph operators, and all others interested in the practical applications of electricity.

It is addressed particularly to students and to the thousands of practical workers in the electrical field whose technical education is limited. For this reason higher mathematics have been avoided and the subject matter explained in simple language in connection with a large number of diagrams, prepared especially for the text.

Among the special writers and collaborators of the work may be mentioned Prof. F. B. Crocker of Columbia University, Prof. William Esty of Lehigh University, Prof. D. C. Jackson collaborating with Prof. George C. Shaad of the University of Wisconsin, Prof. Louis Derr of the Mass. Inst. of Technology, and numerous other well-known authorities. All of the standard works of technical literature have also been freely consulted in the preparation of this Cyclopedia.

Part I commences with the elements of electricity and magnetism, and contains descriptions and illustrations explaining the fundamental laws of electricity. This part of the work necessarily includes many of the stereotyped experiments found in all of the elementary works on electricity and are given here clearly but briefly.

Part II includes the subject of dynamo electric machinery and storage batteries. Beginning with the theory and fundamental principles of the electric generator the book carries the reader through the elementary types of machines and by means of lucid explanations and easily understood diagrams leads up to the modern types of generators.

Part III. The third volume is devoted to electric lighting, electric railways, the operation of dynamo electric machinery and the general principles of power station design.

Part IV.—The fourth volume of the Cyclopedia of Applied Electricity is devoted entirely to alternating currents and automatic current machinery. This type of machinery, while in some respects the simplest of electrical machinery, is undoubtedly the most difficult for the student and non-technical man to understand, and for this reason great care has been taken to avoid the mathematical discussions which invariably accompany the literature of alternating currents.

Part V.—The fifth volume is devoted entirely to the telephone. The author, Wm. C. Boyrer, is a telephone engineer of wide experience and has taken up the subject in a simple and at the same time comprehensive manner, the idea being to make a first class text book for the student, as well as a reference book for the practical telephone exchange operator.

The Credit Man and His Work; by E. St. Elmo Lewis; The Bookkeeper Publishing Co., Detroit, Mich. 300 pages, 7 1/2 by 5. Price $2.00

The importance of credit in commerce and industry makes it unnecessary to dwell upon the value of a handbook on this subject, written, as this one is, from a business man's standpoint, and not from that of the theorist or the school man. Following is an abstract of the table of contents:

A few things a history of credit teaches; what is credit; the character of the business; business methods affording credit data; personal character of the management; competition's effects on credit risks; credit indemnity insurance; the credit statement; the credit man as an auditor; capital and resources; cost of production; instalment accounts; the salesman and the credit man; getting the money; the slow-pay customer; credit statements in law; contracts; books of account in law; going to law; credit organizations; credit information systems; systems for the collection department; the successful credit man. The work is worthy the careful study of every business man.

The Calculation of Cotton Goods (Die Calculation von Waren aus Baumwollgarnen): 9 in. by 12 in.; Ernst Frank, Mistek, Austria. Price, $4.00.

This is the latest work on textile calculations to be published in the German language and consists of ten sections. Section 1 treats of yarn numbering. The author states that owing to its general use the English system of numbering is made the basis for his work, the French and metric systems being included only for purposes of comparison. Sections 2 and 3 contain rules for calculating the warp and filling yarn required for goods laid out by the Vienna inch and centimeter, the weight being given in English pounds. Section 4 contains tables showing the percentage of take-up for different sizes of yarn and sets of filling. Sections 5 and 6 give tables showing the weight of filling required for 100 meters of cloth for each centimeter in width and for different sizes and sets of yarn, the weight being given in English pounds and the width in Paris inches. Price lists for spooling, warping, drawing-in and weaving are also added. Sections 7, 8 and 9 consist of detailed weaving price lists, including tables showing the general expenses for 100 meters of cloth made of different sizes of yarn and sets per Vienna or Paris inch. Section 10 contains various examples showing the method of estimating the cost of cotton goods.

The author is a practical cotton manufacturer and the work is based on the methods used and data compiled by him during many years. It is carefully prepared and we regret that the complication of weights and measures renders it unsuitable for direct employment in American mills. The principles which it embodies are, however, well worthy of careful study by our manufacturers. The text is in German.

Technical Schools for the German Textile Industry (Fachschulen fur Textilindustrie Deutschlands); published by the Litterarischen Monatsberichte, Steglitz-Berlin, Germany. Price 50 cents.

This pamphlet contains an interesting description of the textile schools in Germany and gives illustrations of the school buildings and the courses of study, tuition rates, etc.

Spinning and Weaving the Native Cotton of Dahomey and the Soudan; published by the Association Cotonniere Coloniale, Paris, France.

This pamphlet gives an account of the attempts made by this association to cultivate cotton in Dahomey and the Soudan, together with the results of manufacturing yarn and cloth from the first cotton received from those countries. We gave extracts of these results in a recent issue of the magazine; the pamphlet, which is in French, goes into the subject more in detail.

Lexicon of the Textile Art in all Ages (Handworterbuch der Textilkunde aller Zeiten und Voelker); by Max Heiden; 664 pages, 6 1/2 by 10 inches; 356 illustrations; Ferdinand Enke, Stuttgart, Germany. Price $6.00.

This work has been compiled by Herr Heiden with the assistance of the Royal Technical Museum at Stuttgart. It is a lexicon and gazetteer combined and gives a brief explanation of each term and name referred to, including all those in use from the earliest to the most recent times. The text is in German.

Modern Style (Der Moderne Stil); Parts 1 to 12; Julius Hoffmann, Stuttgart, Germany. Price $6.00.

This collection of designs is published with the object of making designers conversant with the latest trend in the development of artistic designs. It includes designs suitable for the decoration of ceramics, textile fabrics, upholstery goods, tapestry, and the products of other decorative arts. The latest edition, which is now before us, contains many new and original ideas and will prove of great value to designers in all countries. The work consists almost entirely of designs; the text is in German and very brief. A copy of this work can be seen at our Boston office.

Business Literature.

The New Penberthy Catalogue. The Penberthy Injector Company, Detroit, Mich. A new catalogue which describes and illustrates line for the year 1905.

The catalogue is a handsome book which will be greatly appreciated by every dealer into whose hands it is placed. Besides the well-known Penberthy automatic injector, familiar to so many steam users, it lists and describes a very full line of steam specialties, including the Penberthy autopositive injectors, ejectors, force-feed oil pumps, oil and grease pumps, high and low water alarms, water gages, gage cocks and other engine-room necessities.

The catalogue is conveniently indexed and every dealer who handles steam specialties should have a copy of it as it will be of great value to him for daily reference. It is well printed and handsomely illustrated in a way which does credit to the Penberthy Injector Company.

New Calendars.

Shaw Stocking Co., Lowell, Mass. The photograph of a small boy seated on a packing case, wearing a hat and not much else while he trumpets the praise of the Shawknit hosiery through a horn several sizes too large for him, is a means taken by the makers of these celebrated goods to bring them before the public and incidentally remind them of the coming of another year. It must be seen to be appreciated.

Wardwell Needle Co., Lakeport, N. H. The 1905 calendar of these makers of the Excelsior needles for hosiery merits the title of a symphony in gray. On a background of heavy gray paper is developed in lighter tones a fleur-de-lis pattern, the whole forming a frame for "The American Beauties," a large oval reproduction of the painting by Philip Boileau. The calendar is a large one, fourteen by thirty-eight inches, and is designed for office or library.

C. R. Simister & Son.

A large office calendar in attractive design and coloring is being sent to the friends of these dealers in shoddy at Manayunk, Philadelphia, Pa.

Fire Protection for Cotton Mills.

Few cotton mills are so situated that they can depend upon a town or city fire department for assistance in case of fire, and even those mills that are so fortunately located within a district covered by a fire department, are liable to be totally destroyed before help can reach them. The quicker a stream of water can be turned on a blaze the greater are the chances of being able to control it before serious damage is done. This is particularly true of cotton mills, where every thing is of such a highly inflammable nature. Insurance rates are necessarily high and in many cases prohibitive on this kind of property, but there is a form of insurance within the reach of all, the cost of which for a lifetime protection would hardly amount to one or two years' insurance premiums.

Install a Rotary Fire Pump connected to a gas or gasoline engine; by gearing to water power so that the pump can be operated independently of other machinery, or better still connect it to an electric motor, if the current is available. Pipe the discharge to several fire plugs in different parts of the factory and have each plug fitted with a length of hose and nozzle. As soon as fire is discovered, the pump can be started and within a few moments one or more streams can be directed upon the blaze, preventing serious conflagration.

An independent power rotary pump is preferable for this kind of service, as they are not dependent upon the steam pressure in the boiler, which may be too low to operate a steam pump, especially out of business hours, or at night when fires more often occur; a point of perhaps greater importance is that the power rotary pump is all made of metal, iron or bronze body and bronze working parts, so the pump may stand idle for a long time and still be in working order immediately, as there are no packings or valves to dry out and become useless.

The power rotary fire pumps built by The Goulds Manufacturing Co., of Seneca Falls, N. Y., are constructed to meet all the requirements of the Fire Underwriters Association, and their pumps have been approved by them. It is therefore possible to have the insurance rate on your property reduced very considerably by installing a Gould fire pump.

A Good Opening.

An unusual opportunity for a man of some capital and experience in the manufacture of hosiery, is offered in the Special Notice advertising pages of this issue. The proprietor of a large and well established knitting mill in the Middle Western States is desirous of retiring from active business, and offers the plant as a going concern on very reasonable terms. The mill has been kept thoroughly up to date in point of machinery equipment and has orders booked ahead for a season which show a satisfactory profit. It has an established trade and to an experienced manufacturer offers unusual opportunity for profitable investment.

Transfer of Business.

The following announcement to the trade has been made by the Textile-Finishing Machinery Co., of Providence, R. I.:

We beg to advise you that we have made arrangements with the Lockwood Mfg. Co., of East Boston, Mass., to take over their business pertaining to the manufacture of bleaching, dyeing and finishing machinery; that we have obtained possession of all their patterns, drawings and good will, and shall be pleased to receive any inquiries in regard to the above machinery.

We would also state that we have purchased of Wm. Birch, of Manchester, England, his American and Canadian patents for cloth stretching machine, and shall be pleased to receive inquiries in regard to this machine, and to demonstrate, either by letter or personal interview, the merits of the stretcher.

New Yarn Agent.

Wolstenholme & Clarke, spinners of worsted and worsted merino yarns at Manayunk, Philadelphia, Pa., announce to the trade that H. S. Hicks, formerly with Thos. Wolstenholme Sons & Co., has charge of selling their yarns.

A Limited Liability Company in the Dye Trade.

The following notice has been sent to the trade by Leopold Cassella & Co., Frankfort o/M., Germany:

Frankfort o/M., October, 1904.

Sir:—We herewith beg to inform you that we have transformed our firm established since 1828 into a "Gesellschaft mit beschrankter Haftung" (Limited Liability Company).

The business, which is carried on with a capital of thirty million marks (20 millions of stock capital and 10 millions of bonds), will be conducted on the same principles as heretofore by our partners, Dr. Arthur Weinberg and Consul-General Carl Weinberg.

Requesting you kindly to take note of the subjoined signatures, we are, sir, Yours truly,

Leopold Cassella & Co.

New York Office.

The Diamond Drill & Machine Co., of Birdsboro, Pa., manufacturers of the Jackson belt lacer, state the demand for this machine has been so large during the past year that it has taxed this department of their business to the utmost, and from the number of inquiries received, they see ahead the busiest season they have yet experienced. To further facilitate the handling of orders, they have opened an office at 52 Broadway New York City, where they are in a position to answer all inquiries regarding their specialties, very promptly.

Contracts Lost by English Wool Combers.

The news that Japan will throw great reinforcements into the field so soon as the Manchurian winter is over is of no small interest to textile England. It is not only that army cloths will be wanted—there will also be a new call for hosiery yarn, of which Britain and Germany have already spun quantities measurable by the million pounds avoirdupois for the Japanese requirements. The demand has been for four-ply botany thread of notably good quality, in white and in "Persian" brown. A portion of the contracts has been for material dry-combed, and it is this portion that has been secured by German spinners. The yarn from wool combed in oil is such as capable Halifax or Leicester producers would find little difficulty in making. Further contracts are anticipated in March next, unless developments in the interim precipitate an earlier requirement. Samples from many sources are already on their way eastward, and replies are being awaited with some little anxiety in several quarters. In an impersonal way it has occurred to numbers of people that the inability of spinners in this country to grapple with the orders for dry-combed yarn is unfortunate. Although much has been made of the desirability of having dress-stuffs free from any taint of oil, less has been said of the case of hoisery yarns. The passing to Germany of orders aggregating many hundreds of thousands of pounds may however, do somewhat to impress woolcombers with the need for new machinery and methods to combat foreign competition effectually. Perhaps, with a little co-operation from its customers, the reconstructed combination, Woolcombers, Ltd., might be led to exploit this foreign field. The German hosiery yarn mills are understood to be generally prosperous. This country consumes a fair proportion of their output; and when to this total is added the import of dress-stuffs that Bradford cannot make (for want of facilities for combing dry), an encouraging volume of prospective business is brought into view. The fact is hardly disputed, but between difficulties of less or more relevancy that are foreseen, and the proverbial indifference of all persons to a business that is everybody's, nothing gets done. In these circumstances one can hardly do more than draw attention to opportunities that have been or will be lost for want of a spirit of greater enterprise.—Textile Mercury.

The American Pioneer Pressed Steel Shaft Hanger.

The Standard Pressed Steel Co., Philadelphia, Pa., are calling the attention of the trade to their pressed steel hanger by means of a large poster, a copy of which will be mailed to any one who may apply for it. The illustration shows the construction of the hanger in detail, and is a very effective means of calling attention to its mechanical merits, among which are rigidity, lightness, durability and convenience in operation. It is sold throughout the United States and Canada at a very low price.

Chestnut Hill Souvenir.

The articles which appeared in serial form in the Textile World Record about the mills of Chestnut Hill have been published in pamphlet form, and may be had for 25 cents per copy, and five copies for $1. These articles have been reprinted at the request of a number of persons whose memories of this typical New England mill village are extremely pleasant, with the idea of preserving them in convenient form.

Weaving in Hungary.

In Hungary, according to the Royal Hungarian Commercial Museum, a weaver operates 3 looms of ordinary mechanism, or 15 Northrop looms. Bobbin shuttles are used and threaded by mouth suction. The looms cost in Hungary anywhere from 400 to 1,000 crowns ($81.20 to $203). They weave from 3 to 4 yards of crude cotton cloth per hour. Weavers work weekly about 65 hours and receive from 12 to 16 crowns ($2.44 to $3.25) per week. The Northrop machine is used and manufactured in large numbers by the Hungarian Textile Industry Company (Limited), at Rozsahegy, Lipto County, in north Hungary. It is estimated that about 5,000 to 6,000 cotton looms are in use in Hungary.—Frank Dyer Chester, Consul-General, Budapest.

Commercial Tricks.

In an address at Manchester, Eng., Mr. Emmott, M. P., member for Oldham, gave his opinion regarding commercial morality, from which we quote as follows:

I find, said Mr. Emmott, the great majority of people honest. So far as trades unions were concerned, he continued, on the whole they made for honesty and commercial morality. They provided by far the best, and practically the only remedy, against the greed of an unscrupulous employer—the most despicable form of commercial immorality.

The one danger about trades unions, although he did not himself know of any instance, was that they might lend themselves here and there to the practice known as the ca' canny—authorizing and even encouraging men to deliberately do less work than they were reasonably capable of doing.

On the other side, there was the practice known as driving, which was equally objectionable.

Discussing the duty of commercial men to the municipality and to the State he said there was an enormous increase in the rates, while abroad for the last twenty years there had been a tendency to raise tariffs against us. These two things had led to an increase in some kinds of commercial immorality. Of this Mr. Emmott gave two illustrations. One was that of a manufacturer who made arrangements to take a building for which he was to pay $500 for rent and $250 for "turning," and the bargain went off because the owner of the property would not make it appear that the $500 was for "turning" and the $250 for rent, in order that the proposed tenant might be assessed to the rates at the lower sum.

He was told by Manchester merchants that it was a very common thing for people to come to them with orders and to ask for two invoices, one giving the actual sale price, and the other a "fancy" invoice for the purpose of sending the goods abroad under some misleading description which enabled them to get through the foreign Customs House at a reduced price. (A voice: "Quite true.")

If a merchant declined to do that he was told that application would have to be made to some German who was less scrupulous. That was how trade actually went out of the country, and it constituted a grave temptation for commercial men.

Samuel M. Langston's New Works.

The latter part of December Samuel M. Langston removed to Ninth above Market Street, Camden, N. J., and succeeded in getting in operation in his new quarters Jan. 1, 1905. Having increased facilities he will be able to manufacture the Langston cutter head and paper box machinery with greater promptness than ever.

New Arrival in Pittsburg District.

The well known elevator firm, Morse, Williams & Co., Philadelphia, with branch offices in Boston, New York, Baltimore, and Atlanta, have added another branch to the list by opening an office at 1018 Penn Ave., Pittsburg, Pa., for the sale and erection of all classes of freight and passenger elevators. It will be in charge of a practical elevator man prepared to submit preliminary plans and specifications and furnish any information desired by architects, builders or owners. This company has thirty years' experience and a record of 17,000 elevators sold. Some of its references in the Pittsburg district are: Kaufman Bros., Pittsburg, Union Station, Pittsburg, Hydraulic Passenger and Freight Elevators; Keystone Warehouse Co., Buffalo, Buckingham Apartments, Pittsburg, Direct Electric Passenger and Freight Elevators; Diamond Match Co., Barbertown, Ohio; Westinghouse Elec. & Mfg. Co., Pittsburg, New York and Penna Co., Johnsonburg, Belt and Belt Electric Elevators. They also manufacture and install hand elevators and dumb waiters. Their machines are recognized as standard for safety, economy, efficiency and durability.

Sizing and Finishing Materials.

The Arabol Mfg. Co., 100 William St., New York, make a specialty of soluble oils, alizarine assistants, Turkey red oils, of different percentages, starches and other compounds for use in finishing, dyeing and printing textile goods of every description. Their late additions, the Arabol size blender, and the International prize starch, a substitute for potato starch, which have been noticed in a recent issue, promise to increase the sale of this company's staples, which have made the sign of the Sphinx so popular with the trade.

Varieties of Vim Leather.

It is an error under which quite a few users of Vim leather are laboring, that the particular variety of Vim leather they are using or have used is the only variety made. Messrs. E. F. Houghton & Co have just issued a brief four page circular giving some reasons for their claims of superiority for Vim leather and explaining the several varieties which they make, which circular they will mail free to anyone upon mention of this notice.

Recent Textile Patents.

LOOM HEALD Wire, Carpet. 774,909. John Cocker, Halifax, England.

LOOM SHEDDING Mechanism. 775,076. Randolph Crompton, Worcester, Mass., assignor to himself, George Crompton, Edward D. Thayer and William B. Scofield, Worcester, Mass.

LOOM SHUTTLE. 774,944. Henry A. Kennedy, Warwick, R. I., assignor of one-half to John J. Bellows, Providence, R. I.

LOOM SHUTTLE Motion. 773,396. William F. Kintzing, Hanover, Pa.

LOOM SHUTTLE Motion, Magnetic. 773,010. Henry S. Furminger, Mittineague, Mass., assignor of one-half to William H. Miller, Springfield, Mass.

LOOM SPLIT SHED Mechanism. 774,225. Henry P. Wirz, Paterson, N. J., assignor to Schaum & Uhlinger, Philadelphia, Pa.

LOOM STOP Motion. 774,285. Merrill O. Steere, Pawtucket, R. I.

LOOM TAPE Winder. 774,323. Paul Hesse, Pawtucket, R. I., assignor of two-fifths to Frank Wood Mfg. Co., Cumberland, R. I.

LOOM TEMPLE. 774,374. Arthur E. Benson, Magnolia, Miss., assignor to Draper Co., Hopedale, Mass.

LOOM WARP Stop Motion. 774,316. John H. Foster, Fall River, Mass.

LOOM FOR WEAVING Pile Fabrics. 775,218. Alfred Heald, Philadelphia, Pa.

LOOM, Weft Replenishing. 774,459. Earl A. Thissell, Lowell, Mass.

LOOM. 775,895. James H. Cobb, Belton, S. C., assignor to Draper Co., Hopedale, Mass.

LOOM BOX Motion. 777,196. William A. Fowler, Salisbury, N. C.

LOOM CENTRE Selvage Forming Attachment. 776,300. Arthur S. Cowan, Worcester, Mass., assignor to Crompton & Knowles Loom Works.

LOOM FILLING End Clearer. 777,237. Arthur E. Benson, Magnolia, Miss., assignor to Draper Co., Hopedale, Mass.

LOOM FILLING Replenishing. 777,276. Bernard Crossley, Burnley, England, assignor to Burnley Automatic Loom, Ltd., Manchester, England.

LOOM. Lappet. 775,893. John C. Brooks, Paterson, N. J., assignor to Draper Co.

LOOM LAY Downhold. 775,881. Everett S. Wood, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM LET OFF Mechanism. 775,336. John T. Meats, Taunton, Mass., assignor to Taunton Machine Works, Taunton, Mass.

LOOM PICKER. 776,972. Frank A. Wardwell, Methuen, Mass.

LOOM PICKER Motion Check. 776,399. Charles O. Huntoon, Somers, Conn.

LOOM PICKER Stick Motion. 776,584. Clare H. Draper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM PICKER Stick Motion. 775,890. Gideon Boisvert, Manchester, N. H., assignor to Draper Co., Hopedale, Mass.

LOOM PILE Wire Motion. 776,375. Robert Beattie, Littlefalls, and Alexander McKendrick, Paterson, N. J.

LOOM SHUTTLE. 775,420. John T. Gregory and Joseph Brown, Fall River, Mass.

LOOM SHUTTLE Check. 775,308. Frederick Ott, Woonsocket, R. I.

LOOM SHUTTLE Locking Means. 775,868. Melvin L. Stone, Lowell, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM STOP Motion. 777,089. George Goodline, Philadelphia, Pa., assignor to Crompton-Thayer Loom Co., Worcester, Mass.

LOOM TEMPLE. 775,775. Alfred Meunier, Fall River, Mass.

LOOM WARP Beam. 776,082. Anthony J. O'Reilly, Worcester, Mass., assignor to Crompton-Thayer Loom Co., Worcester, Mass.

LOOM WARP Stop Motion. 778,132. Allan A. Johnson, Natic, R. I., assignor to Kip-Armstrong Co., New York City.

LOOM HEAD MOTION. 770,167. Randolph Crompton, Worcester, Mass.

LOOM HEDDLE. 770,282. Julius Grob, Horgen, Switzerland.

BILLIARD CLOTH. 780,185. Vincent B. Hubbell, New York City.

BILLIARD CLOTH. 780,186. Vincent B. Hubbell, New York City.

BOBBIN. 779,826. John F. Williams, Charleston, S. C.

CLOTH CLAMP for Textile Machinery. 779,133. Howard L. Quick, New York, N. Y.

COTTON CHOPPER. 780,110. Thomas J. Lowry, Mountairy, N. C.

COTTON CONDENSER Attachment. 779,635. Clements A. Brown and Amasa St. Onge, Providence, R. I.

COTTON GIN. 778,774. James E. Cheesman, East Orange, N. J., assignor to the Cheesman Cotton Gin Co., New York.

COTTON HANDLING Apparatus. 778,983. Robert B. Lumpkin, Mart, Texas.

COTTON PICKER. 779,945. Max E. Lehmann, Baton Rouge, La.

COTTON PICKING Machine. 779,129. John N. McEachern, Highland, Texas.

DRAWING FRAME. 779,799. Loren W. Penney, Newton, Mass., assignor to Saco & Pettee Machine Shops, Newton, Mass.

DYE VAT Compression Top. 780,400. James A. Willard, Chattanooga, Tenn., assignor to Vacuum Dyeing Machine Co., Chattanooga, Tenn.

DYEING. 779,228. Heinrich Mann, Munich, Germany.

DYEING APPARATUS. 780,399. James A. Willard, Chattanooga, Tenn.

DYEING MACHINE. 778,236. John W. Fries, Winston Salem, N. C.

DYEING MACHINE. 780,398. James A. Willard, Chattanooga, Tenn., assignor to Vacuum Dyeing Machine Co., Chattanooga, Tenn.

DYEING SILK. 780,924. Jacob Weidmann, Paterson, N. J.

DYEING VAT. 780,402. James A. Willard, Chattanooga, Tenn., assignor to Vacuum Dyeing Machine Co., Chattanooga, Tenn.

FABRIC CLEANING Machine, Pneumatic. 780,517. Zelma B. Mead and Seymour G. Mead, Cincinnati, Ohio.

FABRICS With Fluids, Apparatus for Treating. 779,076. Julius Gebauer, Charlottenburg, Germany.

FULLING MACHINE Stop Motion. 779,657. William H. Leavitt, Newport, Me.

HACKLING MACHINE. 778,351. Edouard C. Crepy and Louis Fremaux, Brussels, Belgium.

LOOM. 779,025. William R. Burrows, Newark, N. J.

LOOM. 779,997. John R. Fitton, Worcester, Mass.

LOOM BOBBIN Receptacle, Automatic. 779,628. Melvin L. Stone, Lowell, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM FILLING FORK. 779,966. Richard Riley, Fall River, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM FILLING. Replenishing. 780,266. Fernando G. Cobb, Huntsville, Ala., and James H. Cobb, Belton, S. C., assignors to Draper Co., Hopedale, Mass.

LOOM FRICTION Let Off Mechanism. 778,668. Thomas Hudson and James A. Duncan, Sherbrooke, Canada.

LOOM HARNESS. 779,193. Paul A. Wagner, Carlstadt, N. J.

LOOM Having Retractile Reeds. 780,737. Peter C. Stadler, Paterson, N. J.

LOOM TAKE UP Mechanism. 778,612. William S. Southwick, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM WARP Thread Holder. 779,944. Harold Lee, Manchester, England.

LOOM FOR WEAVING Embroidered Goods. 778,880. Jean-Baptiste Monnet, Bourgoin, and Paul Beier and Louis Magnin, Lyons, France.

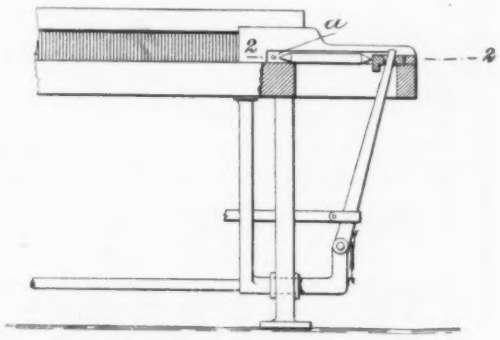
LOOM. 775,558. William F. Draper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM. 775,898. Eben S. Draper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

PILE FABRICS, Machine for Cutting Open the Weft Loops of. 779,040. Paul Hertzog, Muenchen Gladbach, Germany.

PRINTING Textile Materials. 780,636. Jacques Cadgene, Zurich, Switzerland.

SHUTTLE BINDER. 779,344. Horatio B. Beckman, Newburgh, N. Y.



LOOM for Weaving Carpets. 776,208. John W. Tillotson, Samuel S. Tillotson and Arthur Stubbs, Halifax, England.

LOOM for Weaving Pile Fabric. 775,970. William G. Hartley, Amesbury, Mass., assignor to Hartley Loop Weave Co., Amesbury, Mass.

PILE CUTTING Fabric Machine. 776,548. William Read and Eric Hedin, Warwick, R. I., assignor to Crompton Co., Providence, R. I.

YARN from Magazine Rolls of Short Fibre Material in a Moist Condition, Producing. 776,474. Rudolf Kron, Golzern, Germany.

LOOM PICKER CHECK. 779,902. Sidi H. Bevill, Anderson, S. C., assignor to Draper Co., Hopedale, Mass.

LOOM SHUTTLE CHECKING MEANS. 778,646. John C. Edwards, Brookline, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM SHUTTLE MOTION. 779,484. Joseph Mann and Albert Mann, Bridgeport, Conn.

LOOM SHUTTLE, Self Threading. 780,230. Charles E. Sackett, Fall River, Mass., assignor to Sackett-Marshall Shuttle Co., Fall River, Mass.

LOOM SHUTTLE Tension Device. 780,865. Edward F. Crawshaw, Philadelphia, Pa.

LOOM SHUTTLES, Treating. 780,182. Oscar E. Holdridge, New Bedford, Mass.

LOOM STOPPING Device. 778,453. Thomas Howard, Fall River, Mass.

SHUTTLE SPINDLE. 778,851. Norbert Foerster, New York City.

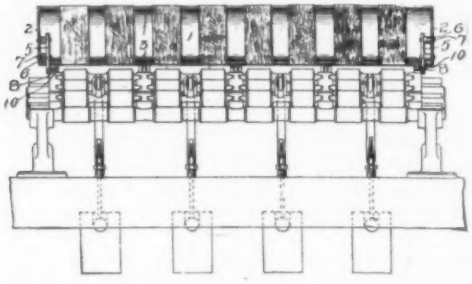
This invention provides a construction which while insuring the strong frictional engagement of the quill necessary to prevent its escape from the spindle during running, yet permits an easy and directly longitudinal application of the cop to the spindle, so that there is no danger of in-

juring the cop, such construction being at the same time cheap, simple and durable. At the same time it utilizes the simplest and cheapest form of cop—namely, a simple tube, preferably with a slight taper, but without grooves or projections such as are used for locking wooden quills.

SPINNING COTTON or Other Fibres. Apparatus for. 778,603. William A. Phillips and Frederick Hutchins, London, England.

SPINNING FRAMES. Top-Clearer for. William Allan, Pawtucket, R. I.

One object of this invention is to provide a top-clearer for spinning-frames which is hinged at its rear side, so that it may readily be upturned to



afford access to the rollers and clearer-cloths.

This top-clearer is composed of sheet metal which is exceedingly strong and durable and adapted to be readily removed from the spinning-frame or turned rearwardly on its hinges to afford access to the rollers and clearer-cloths.

LOOM FOR WEAVING Pile Fabrics. 778,363. William G. Hartley, Amesbury, Mass., assignor to Hartley Loop Weave Co., Amesbury, Mass.

NETTING FABRIC. 780,726. Isaac E. Palmer, Middletown, Conn.

PICKER CHECK. 779,636. Charles H. Buckley, Utica, N. Y.

SPINNING RING. 778,799. Frank Potts and James W. Hurst, Stockport, England.

This invention relates to rings and travelers for spinning and doubling yarns and is designed to prevent the formation of black or dirty yarn consequent upon grease and oil from the ring reaching the cop as it is being spun.

As the ring and traveler are at present con-

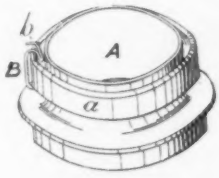


Fig. 1.

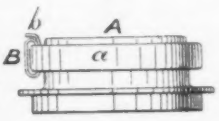


Fig. 2.

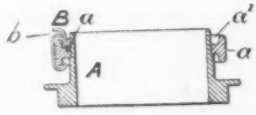


Fig. 3.

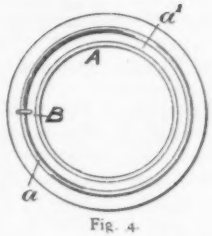


Fig. 4.

structed the traveler is arranged to revolve in the interior of the ring upon or against the inner surface of the ring which is nearest to the cop while it is being formed, and through the necessary lubricant being applied to this surface the yarn is blackened by the contact.

SPINNING RING Traveler. 778,923. Charles E. Trowbridge, Whitinsville, Mass.

SPINNING AND WINDING Machine. Yarn. 778,698. Eli Neild and Henry Marsh, New Bedford, Mass.

SPOOL HOLDER. 778,494. Maurice B. Kreeger, New Orleans, La.

WARP FLOAT Cutting Machine. 779,763. George H. Boynton, North Adams, Mass.

WARP STOP MOTION for Warpers. Automatic. 779,073. Arthur S. Cowan, Worcester, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

YARN DRYING Apparatus. 779,759. Abraham H. Berry, Waltham, and Ervine C. Woodward, Medford, Mass.

YARN OR THREAD. Machine for Testing and Recording the Strength of. 780,806. Caroline Moscrop and William Heald, Manchester, and Arthur P. Okell, Bowdon, England.

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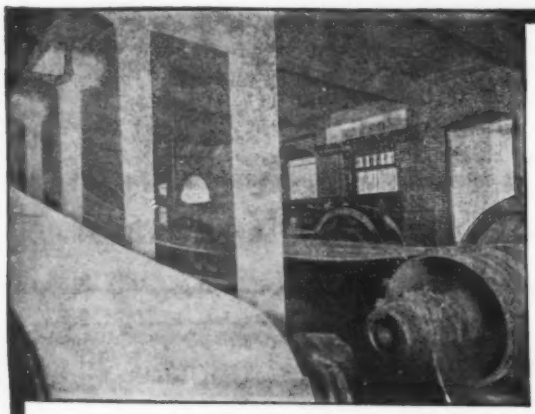

JAMESTOWN, N. Y., Oct. 27, 1904.

CLING-SURFACE CO., Buffalo, N. Y.

GENTLEMEN:—The data herewith explains the conditions of the belts you have photographs of.

Our engine is 1000 H. P. The belts run from two 20 ft. pulleys (62 R. P. M.) to two 31" pulleys (450 R. P. M.) The large belt is 40" face, double leather, on 45 ft. centers. The shorter belt is 40" face, also double leather and on 35 ft. centers. The two belts were doing 500 H. P. when photographed and could do much more.

I have used Cling Surface here for five years and am entirely satisfied with it. These belts are clean, not sticky, pliable and in fine condition and the larger is running with a sag of 4 ft., while the smaller is 22" slack. I believe in slack belts and Cling-Surface permits me to run them so.

Yours very truly,
W. H. COBB, Chief Engr.,
Broadhead Worsted Mills.

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These big belts are a good example of what Cling-Surface is doing. Don't think of Cling-Surface merely as a material for belts. It is that, but its far reaching results make it a means to a new method of belt management—the easy or slack method, and that means low friction load, economy of oil, babbit, belts, fuel, power, time and trouble.

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Largest Manufacturers of Engineering Specialties in the World,
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New York, 26 Cortlandt St. Philadelphia, 1428-32 Callowhill St. New Orleans, Tulane-Newcomb Bldg. London, 35 Great Dover St. Paris, 24 Boulevard Voltaire.

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Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

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Elevators.
Cohoes Foundry & Machine Co.
Jeffrey Manufacturing Co.
Morse, Williams & Co.
Salem Elevator Works.

Employees' Time Recorders.
Pettes & Randall Co.
Riggs & Brothers.

Engravers.
Smith Bros.

Exhaust Heads.
Sturtevant, B. F., Co.

Expert Accountants.
Garry, Brown & Co.

Fans—Exhaust and Ventilating.
—See Ventilating Apparatus.

Fans.
Green Fuel Economizer Co.

Feed Water Heaters.
Green Fuel Economizer Co.
Murray Iron Works Co.
Scaife, W. B. & Sons.

Feed Water Pumps.
Goulds Mfg. Co.
Murray Iron Works Co.
Scaife, W. B. & Sons.

Feed Water Purifiers.
Philadelphia Water Purification Co.

Feeds.
—See Automatic Feeds.

Filters.
Norwood Engineering Co.
Phila. Water Purification Co., The.
Scaife, W. B. & Sons.

Finishing Machinery.
—See Dyeing, Drying, Bleaching and Finishing.

Fire Box Blocks, "Steel Mixture."
McLeod & Henry Co.

Fire Brick.
Borgner, Cyrus, Co.
McLeod & Henry.

Fire Extinguishers.
Badger, E. B. & Sons Co.

Fire Hose.
Eureka Fire Hose Co.

Fire Hydrants.
Norwood Engineering Co.

Fire Proof Doors and Windows.
Badger, E. B., & Sons Co.
Lupton's, David, Sons Co.

Flax, Tow, Hemp and Jute Machinery.
Fairbairn-Lawson-Combes-Barlour, Ltd.
Leigh, Evan A.

Fluted Rolls.
Hood, R. H.
Leigh, Evan A.
Riley, C. E. & Co.
Thurston, A. G. & Son.

Flyers.
Leigh, Evan A.
Textile Machinery Co.

Forges.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Forwarders.
McKeen, John F.

Friction Clutches.
—See Clutches.

Friction Cones.
Evans, G. Frank.

Fuel Economizers.
Green Fuel Economizer Co.

Fulling Mills for Woolen Goods.
Hunt, Rodney, Machine Co.
Hunter, Jas., Machine Co.
Kenyon, D. R. & Son.

Garnetts.
Leigh, Evan A.
Philadelphia Textile Machinery Co.

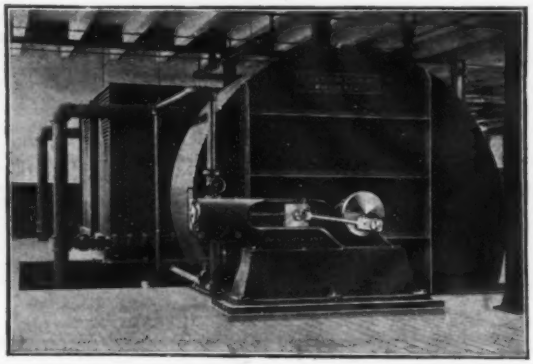
Gas Engines.
Jones, Lewis.

Gas Exhausters.
Sturtevant, B. F., Co.

Gauges.
Crosby Steam Gage & Valve Co.
Lunkenheimer Co.
Walworth Manufacturing Co.

Alphabetical Advertising Index, with page numbers, follows this list.

STURTEVANT



Fans, Blowers, Engines, Motors, Generating Sets, Exhaust Heads, Mechanical Draft Apparatus, Forges, Heating, Ventilating and Drying Apparatus, Industrial Equipments

B. F. STURTEVANT CO., Boston, Mass.

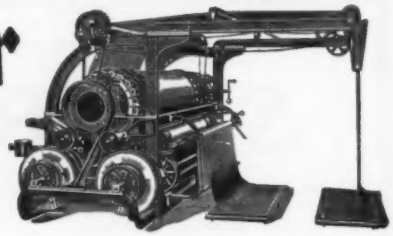
General Office and Works, Hyde Park, Mass.

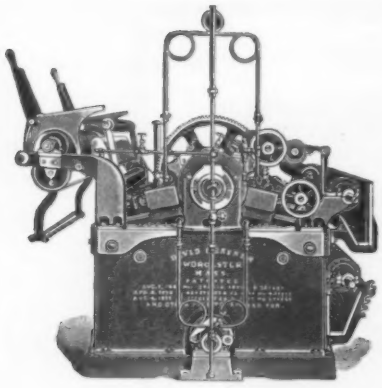
New York Philadelphia Chicago London

35¹

David Gessner

Worcester, Mass.

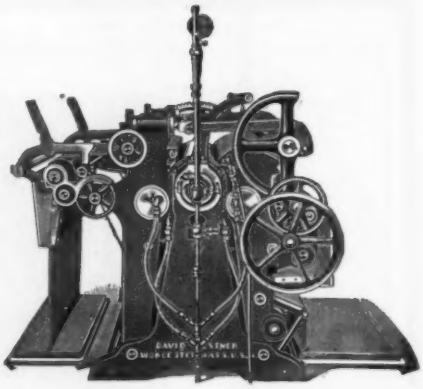




Latest Improved Cloth Finishing Machinery

—

Napping Machines and Presses a Specialty



Gears.
New Process Raw Hide Co.

Gear Cutting Machine.
Whiton, The D. E., Co.

Generating Sets.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Grate Bars.
Tupper, W. W & Co.

Grids for Cotton Openers.
Schaellibaum, Robert, Company.

Heating.
—See Ventilating.

Heddles.
Steel Heddle Mfg. Co.
Stoddard, Haserick, Richards & Co.

Humidifying Apparatus.
American Air Moistening Co.

Hydro Extractors.
American Tool & Machine Co.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.
Whittle, Jas. H.

Injectors.
Lunkenheimer Co.

Ironing Machines for Knit Goods.
Craw, J. W., Laundry Machinery Co.

Iron Work.
Link Belt Engineering Co.

Jacquards.
Halton's, Thomas, Sons.

Knit Goods, Edgings, Trimmings, Etc.
Cathcart, John & Co.
Chapin, Geo. W.
Charles, W. B.
Ebeney Bros.
Friedberger Mfg. Co.
Hepner & Horwitz.
International Button Co.
Kraut & Fite Mfg. Co.
Weimar Bros.

Knit Goods, Finishing Machines, Crochet, Etc.
Craw, J. W., Laundry Machinery Co.
Eastman Machine Co.
Langston, Samuel M.
Merrow Machine Co., The.
Nye & Tredick Co.
Scott & Williams.
Union Special Machine Co.
Willcox & Gibbs Sewing Machine Co.

Knitting Machine Cylinders.
Branson Machine Co.
Paxton & O'Neill.
Stafford & Holt.

Knitting Machinery.
Boss Knitting Machine Co.
Branson Machine Co.
Brinton, H. & Co.
Claes & Flentje.
Cooper, Chas.
Crane Mfg. Co.
Excelsior Knitting Machine Mfg. Co.
Grosser Knitting Machine Co.
Jenckes, E., Mfg. Co.
Jones, Lewis.
Lamb Knitting Mach. Mfg. Co.
Leighton Machine Co.
Mayo, Geo. D., Knitting Machine Co.
Mayo Knitting Machine & Needle Co.
McMichael, A.
National Automatic Knitter Co.
Nye & Tredick Co.
Paxton & O'Neill.
Quaker City Stop Motion Co.
Richter, Wolfgang.
Ruth Machine Co.
Scott & Williams.
Stafford & Holt.
Standard Machine Co.
Taylor, James.
Tompkins Bros.
Walther, Otto.
Wildman Mfg. Co.

Knitting Needles and Supplies.
Branson Machine Co.
Breedon's, Wm., Son.
Brinton, H. & Co.
Cooper, Chas.
Corey, Wm., Co.
Crane Mfg. Co.
Dodge Needle Co.
Excelsior Needle Co.
Gormley, R. W. & Co.
Grosser Knitting Machine Co.
Ives, Loyal T.
Kolb, Frank E.
Lamb Knitting Machine Mfg. Co.
Manufacturers' Supplies Co.
Mayo Knitting Machine & Needle Co.
Page Needle Co.
Treat, Orion.
Wardwell Needle Co.

Labeling Machines.
Beck, Chas., Paper Co., Ltd.

Lamps, Incandescent.
General Electric Co.
Sawyer-Mann Electric Co.
Westinghouse Electric & Mfg. Co.

Lathes.
McCabe, J. J.

Leather.
Houghton, E. F., Co.

Logs and Lumber.
Bass, E. L.

Loom Pickers.
Garland Mfg. Co.

Looms.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Draper Company.
Kilburn, Lincoln & Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Stoddard, Haserick, Richards & Co.
Whitin Machine Works.

Loopers.
Hepworth, John W. & Co.
Leighton Machine Co.

Lubricators,
Borne, Scrymser Co.
Dixon, Jos., Crucible Co.
Lunkenheimer Co.

Alphabetical Advertising Index, with page numbers, follows this list.

THE NEW

CROMPTON-THAYER LOOM COMPANY

MANUFACTURERS OF

FANCY LOOMS

For Weaving Worsted and Woolen, Fancy Cottons and Silk Fabrics.

DOBBIES, BOX MOTIONS AND SUPPLIES.

Works and Offices; 677 Cambridge Street, Worcester, Mass.

Lumpers.
Gerry, George & Son.
Schofield, Wm. Co.

Machinery Dealers.
Fearon, E., Co.
Jefferson, Ed. & Bro.
Lamb, J. K., Textile Mach. Co.
Schofield, Geo. L.
Stead, Arthur
Taylor, James.

Machinists' Tools.
Curtis & Marble Machine Co.
McCabe, J. J.
Whiton, The D. E. Co.

Mails.
Walder, J.

Measuring and Folding Machines.
Elliott & Hall.
Fabric Measuring & Packaging Co.

Mechanical Draft.
American Blower Co.
Boston Blower Co.
Buffalo Forge Co.
Green Fuel Economizer Co.
Massachusetts Fan Co.
Sturtevant, B. F., Co.

Mechanical Engineers.
American Blower Co.
Buffalo Forge Co.
Dean & Main.
Murray Iron Works Co.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.
Suck, Adolph.

Mercerizers.
Greenwood & Bault, R.
Home Bleach & Dye Works.
Lorrimer, Wm. H., Sons Co.

Mercerizing Machinery.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W., & Sons.
Klauder-Weldon Dyeing Machine Co.
Smith, Drum & Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.

Metallic Fire-proof Window Frames and Sashes.
Badger, E. B., & Sons Co.
Lupton's, David, Sons Co.

Mill Architects.
—See Architects and Mill Engineers

Mill Brushes.
—See Brushes.

Mill Builders and Engineers.
Ferguson, John W.

Mill Sewing Machines.
—See Sewing Machines and Supplies

Mill Supplies.
American Supply Co.
Bamford & Smith.
Barker, James.
Buckley's, Benj., Son., Gun Mill.
Burlington Basket Co.
Crosby Steam Gage and Valve Co.
Dixon Lubricating Saddle Co.
Easton-Burnham Co.
Eureka Fire Hose Co.
Garland Mfg. Co.
Houghton, E. F., Co.
Jefferson, Ed., & Bro.
Jeffrey Manufacturing Co.
Kolb, Frank E.
Lane, W. T., & Bro.
Leigh, Evan A.
Main Belting Co.
Morris & Co.
Murphy, E. W., & Co.
Philadelphia Drying Machinery Co.
Riley, C. E., & Co.
Richardson Bros.
Shaw, Victor, Ring Traveler Co.
Stephenson Mfg. Co.
Stoddard, Haserick, Richards & Co.
Thurston, A. G., & Son.
Tucker, W. W. & C. F.
United States Supply Co.
Ward & Vandegrift.
Walworth Manufacturing Co.

Motors.
—See Electric Motors.

Napper Grinders.
Roy, B. S. & Son.

Napping Machinery.
American Napping Machine Co.
Curtis & Marble Machine Co.
Gessner, David.
Jones, Lewis.
Leigh, Evan A.
Parks & Woolsen Machinery Co.
Whiteley, William, & Sons, Ltd.

Noils (Silk).
Malcolm Mills Co.
Ryle, Wm., & Co.

Oil Cups.
Lunkenheimer Co.
Walworth Manufacturing Co.

Oils.
Borne, Scrymser Co.
Murphy, E. W., & Co.
New York & New Jersey Lubricant Co.
Stephenson Mfg. Co.

Oil Hole Covers.
Tucker, W. W. & C. F.

Overhead Tracks.
Cohoes Foundry & Machine Co.

Overseaming Machines.
Merrow Machine Co.
Willcox & Gibbs Sewing Machine Co.

Pantagraphs for Mill Engraving.
Johnson, C. A., & Co.

Paper.
Richardson Bros.
Smyth, J. L. N. Paper Co.

Paper Boards.
Shryock, J. K.
Smyth, J. L. N. Paper Co.

Alphabetical Advertising Index, with page numbers, follows this list.

LEATHER BELTING ECONOMY.

In Shultz "Sable" Rawhide Belting, you get the full strength of the rawhide with its long, pliable fibres, unbroken and unseparated. You get strength—with a minimum stretch—that you cannot procure in oak leather belting because oak tanning breaks up the fibres, makes them short and stubby—forces them apart. In

Shultz "SABLE" Rawhide Belting

the surfaces only are tanned. Tanned by a secret process that makes them feel like kid to the touch and gives a guaranteed pulling power of 33 per cent. more than the best oak tanned belting made. Our "Sable" belt will transmit more power and reduce your future belt bills. Let us send one on 60 days' trial. Illustrated Booklet No. 6 clinches the argument. Write.

Shultz Belting Co., St. Louis, Mo.

New York, 113 Liberty St. Boston, 114 High St. Philadelphia, 116 N. 3d St.

LUNDELL

"Universal" Motors

A NEW LINE OF MOTORS WITH AN UNLIMITED FIELD OF APPLICATION.

District Offices
New York, 135 Broadway
Philadelphia, 1509 Land Title Bldg.
Pittsburg, A. W. Wyckoff & Co.
Chicago, Old Colony Bldg.
Boston and Cincinnati

National Electric Co.,

Milwaukee, Wis.

Sales Offices
Cleveland, Barton Stevensen & Co.
Detroit, Miller Seldon Electric Co.
Denver, Hendrie & Bolthoff Mfg. & Sup. Co.
Seattle } Kilbourne
San Fran'co } & Clark Co

Paper Box Machinery.
Beck, Chas., Paper Co., Ltd
Langston, Samuel M.

Patent Solicitors.
Crosby & Gregory.
Howson & Howson.

Perforated Metals.
Allis-Chalmers Co.
Beckley, A. J., & Co.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co.

Pipes and Fittings.
Pancoast, Henry B., & Co.
Walworth Manufacturing Co.

Pneumatic Conveying.
—See Ventilating.

Power Transmission Machinery.
Allis-Chalmers Co.
American Drying Machinery Co.
American Mfg. Co.
American Pulley Co.
Carlyle-Johnson Machine Co.
Cohoes Foundry & Machine Co.
Columbian Rope Co.
Evans, G. Frank.
Houghton, E. F., Co.
Hunter, Jas., Machine Co.
Jeffrey Manufacturing Co.
Kilburn, Lincoln & Co.
Klein, Chas. C.
Link Belt Engineering Co.
Philadelphia Drying Machinery Co.
Reeves Pulley Co.
Saginaw Manufacturing Co.
Schofield, Wm., Co.
Sellers, William, & Co.
Standard Pressed Steel Co.
Textile Finishing Machinery Co.

Preparatory Machinery (Cotton).
Atherton, A. T., Mach. Co.
Howard & Bullough Am. Machine Co.
Kitson Machine Co.
Leigh, Evan A.
Riley, C. E., & Co.
Saco & Pettee Machine Shops.

Presses.
Boomer & Boschert Press Co.
Butterworth, H. W., & Sons Co.
Curtis & Marble Machine Co.
Gessner, David.
Hart, Charles.
Miller Press & Machine Co.
North Chelmsford Machine Co.
Spence & Rideout.
Textile Finishing Machinery Co.
Woonsocket Machine & Press Co.

Pressers and Flyers.
Baker Machine Co.

Pressure Regulators.
Crosby Steam Gage & Valve Co.
Mason Regulator Co.
Walworth Mfg. Co.

Public Accountants.
Garry, Brown & Co.

Pulleys.
—See Power Transmitting Machinery.

Pulley Covering.
Warren Company, The.

Pumps.
Allis-Chalmers Co.
Goulds Mfg. Co.
Knowles Steam Pump Works.
Textile Finishing Machinery Co.

Pump Governors.
Crosby Steam Gage & Valve Co.
Mason Regulator Co.
Walworth Mfg. Co.

Purifying & Filtration Plants.
Norwood Engineering Co.
Philadelphia Water Purification Co.
Scaife, W. B., & Sons.

Quillers.
Foster Machine Co.
North Chelmsford Machine Co.
Payne, G. W., & Co.

Rag Pickers.
Philadelphia Textile Machinery Co.
Schofield, Wm., Co.

Ramie Tops and Noils.
Tierney, Frank A.

Raw Hide Gears.
New Process Raw Hide Co.

Reed and Harness Manufacturers.
American Supply Co.
Garland Mfg. Co.
Walder, J.

Reels.
North Chelmsford Machine Co.

Reducing Valves.
Crosby Steam Gage & Valve Co.
Mason Regulator Co.
Walworth Mfg. Co.

Regulators (Pressure).
Crosby Steam Gage & Valve Co.
Mason Regulator Co.
Walworth Mfg. Co.

Remnants.
Feingold, H. & D.

Ribbons.
Barton, F. C.
Cheney Bros.

Ring Travelers.
DeHaven Mfg. Co.
Shaw, Victor, Ring Traveler Co.

Roller Leather.
Houghton, E. F., Co.

Rope.
American Mfg. Co.
Columbian Rope Co.

Rope Transmission.
American Mfg. Co.
Columbian Rope Co.

Roving Cans.
Hill, James, Mfg. Co.

Saddles and Stirrups.
Dixon Lubricating Saddle Co.

Scallop Machines.
Merrow Machine Co.

Schools.
Lowell Textile School.
New Bedford Textile School.
Philadelphia Textile School.

Alphabetical Advertising Index, with page numbers, follows this list.

Secondhand Machinery.
——See Mchry. Dealers also classified ads.

Screens (Perforated).
——See under Perforated Metal.
——See Commission Merchants.

Separators.
Draper Co., The.

Sewing Machines and Supplies.
American Overedging & Seaming Mch. Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Curtis & Marble Machine Co.
Dinamore Mfg. Co.
Fales, L. F.
Manufacturers' Supplies Co.
Textile Finishing Machinery Co.
Union Special Machine Co.
Willcox & Gibbs Sewing Machine Co.

Shafting, Hangers, Etc.
——See Power Transmission Machinery.

Shear Blades.
Heusch, Severin.

Shearing Machinery.
——See Dyeing, Drying, Bleaching and Finishing.

Sheet Metal Work.
Barney Ventilating Fan Works.
Lupton's, David, Sons Co.

Shell Rolls.
Thurston, A. G., & Son.

Shoddies.
——See Wool Shoddies.

Shuttles.
——See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W., Sons Co.
Leigh, Evan A.
Mason Machine Works.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.

Silk Mill Supplies.
Hall, I. A., & Co.

Silk Noils.
Fawcett, Hughes.

Singe Plates.
Arlington Mch. Wks. (Arthur Birch, prop.
Butterworth, H. W., Sons Co.
Rome Metal Co.
Taunton, New Bedford Copper Co.
Textile Finishing Machinery Co.

Singeing Machines.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W., Sons Co.
Curtis & Marble Machine Co.
Firth, William, Company.
Knapp, Charles H.
Leigh, Evan A.
Smith, Drum & Co.
Textile Finishing Machinery Co.

Sizing, Starch and Gums.
Araboi Mfg. Co.
Nicol, J. M. & J. S.
O. K. Soap Co.
Stein, Hirsch & Co.

Skylights.
Bickelhaupt, G., Skylight Works.
Drouve, G. Co.
Lord & Burnham Co.
Lupton's, David, Sons Co.

Slashers.
Cohoes Foundry & Machine Co.
Leigh, Evan A.
Lowell Machine Shop.
Riley, C. E., & Co.

Soaps.
Allen, Sherman & Co.
American Soap & Washoline Co.
India Alkali Works.
Nicetown Mfg. Co.
O. K. Soap Co.
Tully, J. J.
Warren Soap Mfg. Co.

Spindles.
Bamford & Smith.
Buckley, Benjamin, Sons, Gun Mill.
Draper Company.
Easton-Burnham Co.
Leigh, Evan A.
Riley, C. E., & Co.
Stoddard, Haserick, Richards & Co.
Ward & Vandegrift.
Whitin Machine Works.

Spindle Tubes.
Bamford & Smith.
Riley, C. E., & Co.
Stoddard, Haserick, Richards & Co.

Spinning Frames.
——See Cotton Machinery.

Spinning Rings.
Draper Company.
Whitinsville Spinning Ring Co.

Spinning Tubes.
Buckley, Benjamin, Sons.

Spools.
——See Bobbins, Spools, Shuttles, Etc.

Spoolers.
Draper Company.
Easton & Burnham Machine Co.
Lindsay, Hyde & Co.
Payne, George W., & Co.

Steam Boilers.
Allen, William Sons Co.
Murray Iron Works Co.
Wickes Bros.

Steam Boiler Insurance.
Hartford Steam Boiler Inspection & Insurance Co.

Steam Boxes.
Allen, William Sons Co.

Steam Engines.
Allis-Chalmers Co.
American Blower Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Buffalo Forge Co.
Fishkill Landing Machine Co.
Harrisburg Foundry & Machine Co.
Hooven (The), Owens & Rentschler Co.
Murray Iron Works Co.
Sturtevant, B. F., & Co.
Textile Finishing Machinery Co.

Steam Jacket Kettles.
Badger, E. B., & Sons Co.

Steam Pumps.
Goulds Manufacturing Co., The.

Steam Specialties.
Butterworth, H. W., Sons Co.
Crosby Steam Gage and Valve Co.
Houghton, E. F., Co.
Lunkenheimer Co.
Mason Regulator Co.
Sturtevant, B. F., Co.
Textile Finishing Machinery Co
Walworth Manufacturing Co.

Steam Traps.
Albany Steam Trap Co.

Stop Motion for Looms.
——See Warp Stop Motions.

Stop Motion for Knitting Machines.
Quaker City Stop Motion Co.
Ruth Machine Co.

Tanks, Tubs and Vats.
Caldwell, W. E., Co.
Cypress Lumber Co.
Hall, Amos H., Son & Co.
Lewis, H. F., & Co.
North Chelmsford Machine Co.
Smith's, John E., Sons.
Stevens Tank & Tower Co.
Textile Finishing Machinery Co.
Woolford, George, Tank and Vat Mfg. Co.

Tapes, Braids and Edgings.
Barton, F. C.
Cathcart, John, & Co.
Chapin, George W.
Friedberger Mfg. Co.
Krout & Fite Mfg. Co.
Weimar Bros.

Telephones.
North Electric Co.
Pettes & Randall Co.

Temples.
Draper Co.

Tentering Machines.
——See Dyeing, Bleaching Machinery, Etc.

Tenter Clips.
——See Dyeing, Drying, Bleaching and Finishing Machinery.

Textile Schools.
——See Schools.

Thread Board for Spinning & Twisting Frames.
Houghton, L. T.

Ticketing Machinery.
——See Labeling Machines.

Trade Mark Stamps.
Kaumagraph Co.

Trucking.
McKeon, John F.

Turbines.
——See Water Wheels.

Twine.
American Mfg. Co.
Richardson Bros.

Twisting Machinery.
Philadelphia Textile Machinery Co.
Whittle, Jas. H.

Valves.
Crosby Steam Gage & Valve Co.
Lunkenheimer Co.
Mason Regulator Co.
Schutte & Koerting Co.
Walworth Mfg. Co.

Ventilating Apparatus.
Allington & Curtis Mfg. Co.
American Air Moistening Co.
American Blower Co.
American Drying Machinery Co.
Barney Ventilating Fan Works.
Bell Pure Air & Cooling Co.

Alphabetical Advertising Index, with page numbers, follows this list.

CATCH THE DUST

IN YOUR MILL OR FACTORY BY USING AN

ALLINGTON OR MARSHALL

Dust Collecting System

ALLINGTON & CURTIS MANUFACTURING CO., Saginaw, Mich.

ANALYSES OF WATER, COAL, SIZES, OILS, SOAPS, CHEMICALS AND MILL SUPPLIES GENERALLY.

PRIVATE TELEPHONE EXCHANGE, 2312 MAIN.

LITTLE & WALKER,

CHEMISTS,

93 BROAD ST., BOSTON.

SPECIALISTS IN THE CHEMISTRY OF FIBRES AND TEXTILE PROCESSES.

EXPERTS IN PATENT CAUSES.

REPORTS ON BLEACHING, DYEING AND FINISHING PROCESSES AND PLANTS.

Ventilating Apparatus—cont.
Berry, A. Hun.
Boston Blower Co.
Buffalo Forge Co.
Drouve, G. Co.
Lord & Burnham Co.
Massachusetts Fan Co.
New York Blower Co.
Nichols, E. M.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Schnitzler, Chas. H.
Sturtevant, B. F., Co.

Warpers.
Draper Company.

Warping and Beaming Machinery.
Draper Co.
Entwistle, T. C., Co.
Philadelphia Textile Machinery Co.
Whiteley, William, & Sons, Ltd.

Warp Stop Motions.
Coldwell-Gildard Co.
Draper Co.
Textile Appliances, Ltd.

Washers (Cloth).
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch, Arthur, Arlington Machine Wks.
Butterworth H. W., & Sons Co.
Hunt, Rodney, Machine Co.
Hunter, Jas., Machine Co.
Kenyon, D. R., & Son.
Philadelphia Drying Machinery Co.
Textile Finishing Machinery Co.

Washing Soda.
Ford, J. B., Co.

Watchman's Clocks.
Nans & Co.
Pettes & Randall Co.
Riggs & Brothers.

Water Purifiers & Filters.
Philadelphia Water Purification Co.
Scaife, W. B., & Sons.

Water Softeners.
Philadelphia Water Purification Co.

Water Towers.
Caldwell, W. E., Co.
Stevens Tank & Tower Co.

Water Wheels.
Hunt, Rodney, Machine Co.
Leffel, James, & Co.
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Water Wheel Governors.
Cohoes Foundry & Machine Co.
Leffel, James, & Co.
Replogle Governor Works.

Whistles.
Lunkenheimer Co.

Winders.
Altemus, J. K.
Atherton, A. T., Machine Co.
Easton & Burnham Machine Co.
Foster Machine Co.
Leigh, Evan A.
Lindsay, Hyde & Co.
Payne, George W. & Co.
Universal Winding Co.
Whiteley, William, & Sons, Ltd.

Winders (Back).
Taylor, James.

Winders (Ball).
North Chelmsford Machine Co.

Wire Stitching Machines.
Beck, Chas., Paper Co., Ltd.

Winders (Hosiery).
Altemus, Jacob K.
Easton & Burnham Machine Co.
Foster Machine Co.
Leighton Machine Co.
Payne, G. W., & Co.
Universal Winding Co.

Wood Pulleys.
Reeves Pulley Co.
Saginaw Manufacturing Co.

Wool.
Stoddard, Haserick, Richards & Co.
Tierney, Frank A.

Wool and Waste Dusters.
Leigh, Evan A.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Schofield, Wm., Co.
Whittle, Jas. H.

Wool Cleaning Compound.
Ford, J. B., Co.
India Alkali Works.

Wool Combing Machinery.
Crompton & Knowles Loom Works.
Leigh, Evan A.
Riley, C. E., & Co
Stoddard, Haserick, Richards & Co.

Woolen and Worsted Machinery.
Altemus, Jacob K.
American Drying Machinery Co.
American Tool & Machine Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Barker, James.
Birch, Arthur, Arlington Machine Wks.
Butterworth, H. W., Sons Co.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Curtis & Marble Machine Co.
Fales, L. F.
Firth, William, Co.
Gessner, David.
Harwood, Geo. S., & Son.
Hood, R. H.
Hunt, Rodney Machine Co.
Hunter, Jas., Machine Co.
Jefferson, Ed., & Bro.
Kenyon, D. R., & Son.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Riley, C. E., & Co.
Roy, B. S. & Son.
Sargent's, C. G., Sons.
Schofield, Geo. L.
Schofield, William, Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Vacuum Dyeing Machine Co.
Whiteley, William, & Sons, Ltd.
Whittle, Jas. H.
Woonsocket Machine & Press Co.

Wool, Non-shrinking Process for.
Heyer, Charles H.

Wool Oiling Apparatus.
Harwood, Geo. S., & Son

Wool Oils.
Borne, Scrymser Co.

Wool Shoddies.
Riverdale Woolen Co.
Slack, Wm. H. H., & Bro.

Wool Washing, Preparing and Drying Machinery.
American Drying Machinery Co.
Hunter, Jas., Machine Co.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Riley, C. E., & Co.
Sargent's, C. G., Sons.
Stoddard, Haserick, Richards & Co.

YARN, THREADS, ETC.

Banding.
Moore, C., & Co.
Sternberg, Fred, & Co.
Toohey, M. J., & Co.

Cotton Yarns.
American Cotton Yarn Exchange.
Ballou Yarn Co.
Catlin & Co.
Chapin, Geo. W.
Charles, W. B.
Dana Warp Mills.
Eddy & Street.
Grant Yarn Co.
Greene & Daniels Mfg. Co.
Harding, Whitman & Co.
Indian Orchard Co.
Jenckes Spinning Co.
Lorimer, E. D.
Mitchell, Jas. E., & Co.
Moeller & Littauer.
Montgomery, J. R., Co.
Monument Mills.
Orswell Mills.
Paulson, Linkroum Co.
Salkeld, A. D., & Bro.
Sternberg, Fred, & Co.
Strouse, Theo. H., & Co.

Flax, Hemp, Jute and Ramie.
Fawcett, Hughes.
Moeller & Littauer.
Sternberg, Fred, & Co.
Tierney, F. A.

Gassed Yarns.
Ballou Yarn Co.
Greene & Daniels Mfg. Co.
Harding, Whitman & Co.
Lorimer, E. D.
Moeller & Littauer.
Sternberg, Fred, & Co.

Glazed Yarns.
Ballou Yarn Co.
Chapin, Geo. W.
Harding, Whitman & Co.
Indian Orchard Co.
Lorimer's, Wm. H., & Sons Co.
Malcolm Mills Co.
Moeller & Littauer.
Orswell Mills.
Salkeld, A. D., & Bro.
Skerry, A. T., & Co.
Sternberg, Fred, & Co.
Strouse, Theo. H., & Co.
Walcott & Campbell Spinning Co., New York Mills.

Harness Twine.
Ballou Yarn Co.
Cranston Worsted Mills.
Fawcett, Hughes.
Moore, C., & Co.
Sternberg, Fred, & Co.

Hosiery and Knitting Yarns.
Boyer, B. F., Co.
Cranston Worsted Mills.
Chapin, George W.
Greene & Daniels Mfg. Co.

Alphabetical Advertising Index, with page numbers, follows this list.

Hosiery and Knitting Yarns—cont.

Harding, Whitman & Co.
Hyde, E. S.
Jenckes Spinning Co.
Mitchell, James E., & Co.
Moeller & Littauer.
Monument Mills.
Queensbury Mills.
Skerry, A. T., & Co.
Sternberg, Fred, & Co.

Mercerized Yarns.

Harding, Whitman & Co.
Harper, E. G.
Indian Orchard Co.
Lorimer, E. D.
Lorimer, Wm. H., & Sons Co.
Moeller & Littauer.
Montgomery, J. R., & Co.
Sternberg, Fred, & Co.
Strouse, Theo. H., & Co.

Mohair Yarns.

Cranston Worsted Mills.
Harding, Whitman & Co.
Moeller & Littauer.
Montgomery, J. R., & Co.

Novelty Yarns, Tinsels, Silk Noils, Etc.

Cranston Worsted Mills.
Indian Orchard Co.
Jenckes Spinning Co.
Malcolm Mills Co.
Moeller & Littauer.
Montgomery, J. R., & Co.
Skerry, A. T., & Co.
Sternberg, Fred & Co.

Silk Noils.

Tierney, F. A.

Silk Yarns.

Chapin, Geo. W.
Cheney Bros.
Eddy & Street.
Ryle, Wm., & Co.

Woolen and Merino Yarns.

Boyer, B. F., Co.
Eaton Rapids Woolen Mills.
Eddy & Street.
Harper, E. J.
Hyde, E. S.
Jenckes Spinning Co.
Moeller & Littauer.
Rockwell, E. M.
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Woolen Yarns.

Adams, Joseph M., Co.
Moeller & Littauer.

Worsted Yarns.

Alleghany Worsted Mills.
Boyer, B. F., Co.
Campion, Richard.
Cranston Worsted Mills.
Harding, Whitman & Co.
Harper, E. G.
Moeller & Littauer.
Pocasset Worsted Co.
Queensbury Mills.
Salkeld, A. D., & Bro.
Skerry, A. T., & Co.
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Alphabetical Advertising Index, with page numbers, follows this list.

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Ventilating Apparatus—cont.
Berry, A. Hun.
Boston Blower Co.
Buffalo Forge Co.
Drouve, G. Co.
Lord & Burnham Co.
Massachusetts Fan Co.
New York Blower Co.
Nichols, E. M.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Schnitzler, Chas. H.
Sturtevant, B. F., Co.

Warpers.
Draper Company.

Warping and Beaming Machinery.
Draper Co.
Entwistle, T. C., Co.
Philadelphia Textile Machinery Co.
Whiteley, William, & Sons, Ltd.

Warp Stop Motions.
Coldwell-Gildard Co.
Draper Co.
Textile Appliances, Ltd.

Washers (Cloth).
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch, Arthur, Arlington Machine Wks.
Butterworth H. W., & Sons Co.
Hunt, Rodney, Machine Co.
Hunter, Jas., Machine Co.
Kenyon, D. R., & Son.
Philadelphia Drying Machinery Co.
Textile Finishing Machinery Co.

Washing Soda.
Ford, J. B., Co.

Watchman's Clocks.
Nans & Co.
Pettes & Randall Co.
Riggs & Brothers.

Water Purifiers & Filters.
Philadelphia Water Purification Co.
Scaife, W. B., & Sons.

Water Softeners.
Philadelphia Water Purification Co.

Water Towers.
Caldwell, W. E., Co.
Stevens Tank & Tower Co.

Water Wheels.
Hunt, Rodney, Machine Co.
Leffel, James, & Co.
Risdon-Alcott Turbine Co.
Smith, S. Morgan, Co.

Water Wheel Governors.
Cohoes Foundry & Machine Co.
Leffel, James, & Co.
Replogle Governor Works.

Whistles.
Lunkenheimer Co.

Winders.
Altemus, J. K.
Atherton, A. T., Machine Co.
Easton & Burnham Machine Co.
Foster Machine Co.
Leigh, Evan A.
Lindsay, Hyde & Co.
Payne, George W., & Co.
Universal Winding Co.
Whiteley, William, & Sons, Ltd.

Winders (Back).
Taylor, James.

Winders (Ball).
North Chelmsford Machine Co.

Wire Stitching Machines.
Beck, Chas., Paper Co., Ltd.

Winders (Hosiery).
Altemus, Jacob K.
Easton & Burnham Machine Co.
Foster Machine Co.
Leighton Machine Co.
Payne, G. W., & Co.
Universal Winding Co.

Wood Pulleys.
Reeves Pulley Co.
Saginaw Manufacturing Co.

Wool.
Stoddard, Haserick, Richards & Co.
Tierney, Frank A.

Wool and Waste Dusters.
Leigh, Evan A.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Schofield, Wm., Co.
Whittle, Jas. H.

Wool Cleaning Compound.
Ford, J. B., Co.
India Alkali Works.

Wool Combing Machinery.
Crompton & Knowles Loom Works.
Leigh, Evan A.
Riley, C. E., & Co
Stoddard, Haserick, Richards & Co.

Woolen and Worsted Machinery.
Altemus, Jacob K.
American Drying Machinery Co.
American Tool & Machine Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Barker, James.
Birch, Arthur, Arlington Machine Wks.
Butterworth, H. W., Sons Co.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Curtis & Marble Machine Co.
Fales, L. F.
Firth, William, Co.
Gessner, David.
Harwood, Geo. S. & Son.
Hood, R. H.
Hunt, Rodney Machine Co.
Hunter, Jas., Machine Co.
Jefferson, Ed., & Bro.
Kenyon, D. R., & Son.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Riley, C. E., & Co.
Roy, B. S. & Son.
Sargent's, C. G., Sons.
Schofield, Geo. L.
Schofield, William, Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Vacuum Dyeing Machine Co.
Whiteley, William, & Sons, Ltd.
Whittle, Jas. H.
Woonsocket Machine & Press Co.

Wool, Non-shrinking Process for.
Heyer, Charles H.

Wool Oiling Apparatus.
Harwood, Geo. S., & Son

Wool Oils.
Borne, Scrymser Co.

Wool Shoddies.
Riverdale Woolen Co.
Slack, Wm. H. H., & Bro.

Wool Washing, Preparing and Drying Machinery.
American Drying Machinery Co.
Hunter, Jas., Machine Co.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Riley, C. E., & Co.
Sargent's, C. G., Sons.
Stoddard, Haserick, Richards & Co.

YARN, THREADS, ETC.

Banding.
Moore, C., & Co.
Sternberg, Fred, & Co.
Toohey, M. J., & Co.

Cotton Yarns.
American Cotton Yarn Exchange.
Ballou Yarn Co.
Catlin & Co.
Chapin, Geo. W.
Charles, W. B.
Dana Warp Mills.
Eddy & Street.
Grant Yarn Co.
Greene & Daniels Mfg. Co.
Harding, Whitman & Co.
Indian Orchard Co.
Jenckes Spinning Co.
Lorimer, E. D.
Mitchell, Jas. E., & Co.
Moeller & Littauer.
Montgomery, J. R., Co.
Monument Mills.
Orswell Mills.
Paulson, Linkroom Co.
Salkeld, A. D., & Bro.
Sternberg, Fred, & Co.
Strouse, Theo. H., & Co.

Flax, Hemp, Jute and Ramie.
Fawcett, Hughes.
Moeller & Littauer.
Sternberg, Fred, & Co.
Tierney, F. A.

Gassed Yarns.
Ballou Yarn Co.
Greene & Daniels Mfg. Co.
Harding, Whitman & Co.
Lorimer, E. D.
Moeller & Littauer.
Sternberg, Fred, & Co.

Glazed Yarns.
Ballou Yarn Co.
Chapin, Geo. W.
Harding, Whitman & Co.
Indian Orchard Co.
Lorimer's, Wm. H., & Sons Co.
Malcolm Mills Co.
Moeller & Littauer.
Orswell Mills.
Salkeld, A. D., & Bro.
Skerry, A. T., & Co.
Sternberg, Fred, & Co.
Strouse, Theo. H., & Co.
Walcott & Campbell Spinning Co., New York Mills.

Harness Twine.
Ballou Yarn Co.
Cranston Worsted Mills.
Fawcett, Hughes.
Moore, C., & Co.
Sternberg, Fred, & Co.

Hosiery and Knitting Yarns.
Boyer, B. F., Co.
Cranston Worsted Mills.
Chapin, George W.
Greene & Daniels Mfg. Co.

Alphabetical Advertising Index, with page numbers, follows this list.

Hosiery and Knitting Yarns—cont.

Harding, Whitman & Co.
Hyde, E. S.
Jenckes Spinning Co.
Mitchell, James E., & Co.
Moeller & Littauer.
Monument Mills.
Queensbury Mills.
Skerry, A. T., & Co.
Sternberg, Fred, & Co.

Mercerized Yarns.
Harding, Whitman & Co.
Harper, E. G.
Indian Orchard Co.
Lorimer, E. D.
Lorimer, Wm. H., & Sons Co.
Moeller & Littauer.
Montgomery, J. R., & Co.
Sternberg, Fred, & Co.
Strouse, Theo. H., & Co.

Mohair Yarns.
Cranston Worsted Mills.
Harding, Whitman & Co.
Moeller & Littauer.
Montgomery, J. R., & Co.

Novelty Yarns, Tinsels, Silk Noils, Etc.
Cranston Worsted Mills.
Indian Orchard Co.
Jenckes Spinning Co.
Malcolm Mills Co.
Moeller & Littauer.
Montgomery, J. R., & Co.
Skerry, A. T., & Co.
Sternberg, Fred & Co.

Silk Noils.
Tierney, F. A.

Silk Yarns.
Chapin, Geo. W.
Cheney Bros.
Eddy & Street.
Ryle, Wm., & Co.

Woolen and Merino Yarns.
Boyer, B. F., Co.
Eaton Rapids Woolen Mills.
Eddy & Street.
Harper, E. J.
Hyde, E. S.
Jenckes Spinning Co.
Moeller & Littauer.
Rockwell, E. M.
Salkeld, A. D., & Bro.
Skerry, A. T., & Co.
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Woolen Yarns.
Adams, Joseph M., Co.
Moeller & Littauer.

Worsted Yarns.
Alleghany Worsted Mills.
Boyer, B. F., Co.
Campion, Richard.
Cranston Worsted Mills.
Harding, Whitman & Co.
Harper, E. G.
Moeller & Littauer.
Pocasset Worsted Co.
Queensbury Mills.
Salkeld, A. D., & Bro.
Skerry, A. T., & Co.
Speed & Stephenson.

Alphabetical Advertising Index, with page numbers, follows this list.

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CINCINNATI OHIO

Canadian representatives Allis-Chalmers-Bullock, Ltd., Montreal.

Alphabetical Index to Advertisements.

Adams, Joseph M., Co. 218
Albany Steam Trap Co. 48
Allegheny Worsted Mills 214
Allen, Sherman & Co. 230
Allen Sons Co., Wm. 233
Allington & Curtis 189
Allis-Chalmers Co. 192
Altemus, Jacob K. 28
American Blower Co. 255
Am. Cotton Yarn Exchange ... 213
Am. Drying Mach. Co. 18
American Mfg. Co. 55
Am. Moistening Co. 31
American Napping Mach. Co.
Outside Back Cover
Am. Overedging and Seaming Machine Co. 53
American Pulley Co., The 36
Am. Soap and Washoline Co. ... 230
American Supply Co. 38
Am. Tool and Machine Co. 43
Arabol Mfg. Co., The 233
Arlington Machine Works 52
Ashworth Bros. 38
Atherton, A. T., Mach. Co. 16
Atteaux, F. E., & Co. 230
Audit and Appraisement Co. 197
Badger, E. B., & Sons Co. 43
Badger Fire Extinguisher Co. .. 43
Bailey, Frank 26
Baker Machine Co. 31
Ballinger & Perrot 196
Ballou Yarn Co. 213
Bamford & Smith 50
Barker, James 50
Barney Ventilating Fan Works 34
Barton, F. C. 213
Beck Paper Co., Chas. 251
Beckley, A. J., Co. 41
Bell Pure Air & Cooling Co. 46
Berlin Aniline Works 228
Berry, A. Hun 55
Bickelhaupt, G., Skylight Works 244
Birch, Arthur 52
Bischoff, C., & Co. 231
Blaisdell, Jr., Co., The S. 205
Boomer & Boschert Press Co. .. 208
Borgner, Cyrus, Co. 44
Borne Scrymser Co. 44
Boss Knitting Machine Works .. 239
Bosson & Lane 226
Boston & Albany R. R. 52
Boston Blower Co. 254
Boyer, B. F., Co. 214
Branson Machine Co. 9
Breedon's Son, Wm. 252
Brinton, H., & Co. 240
Brophy's, T., Sons 223
Brown, W. H. 31
Buckley's, Benj., Son 27
Buffalo Forge Co.
Outside Back Cover
Bull, William C. 246
Burlington Basket Co. 41
Burt Mfg. Co. 15
Butterworth, H. W., & Sons Co. 1
Butterick Pub. Co.
Inside Back Cover
Caldwell, W. E., Co. 228
Campion, Richard 214
Cannon Mills 218
Carlyle Johnson Machine Co. ... 40
Cassella Color Company 229
Cathcart, John, & Co. 250
Catlin & Co. 211
Chaffee Brothers Company 33
Chapin, Geo. W. 216
Charles, William B. 217-220
Cheney Bros. 216
Claes & Flentje 246-251
Cling Surface Mfg. Co. 182
Cohoes Foundry & Mch. Co. 208
Coldwell-Gildard Co. 195
Columbian Rope Co. 47
Cooper, Chas. 246
Corey, Wm., Co. 252
Crane Foundry & Mach. Works 199
Crane Mfg. Co. 239-246
Cranston Worsted Mills 214
Craw, J. W., Laundry Mchy. Co. 248
Crompton & Knowles Loom Works 60
Crompton & Thayer Co. 187
Crosby & Gregory 197
Crosby Steam Gage & Valve Mfg. Co. 208
Curtis & Marble Machine Co. ... 33
Cypress Lumber Co. 44
Dana Warp Mills 210
Davenport Pearl Button Co. 217
Davidson, J. F. 224
Dean & Main 196
De Haven Mfg. Co. 208
Diamond Drill & Mach. Co. 37
Dieterich, J. Earl 198
Dinsmore Mfg. Co. 27
Dixon, Jos., Crucible Co. 31
Dixon Lubricating Saddle Co. .. 39
Dodge Needle Co. 252
Draper Company 3
Drouve, The G., Co. 45
Eastman Machine Co. 251
Easton-Burnham Co. 19
Eaton Rapids Woolen Mills 214
Eddy & Street 214
Elliot & Hall 31
Entwistle, T. C., Co. 33
Eureka Fire Hose Co. 26
Evans, G. Frank 29
Excelsior Knitting Machine Mfg. Co. 244
Excelsior Needle Co. 252
Fabric Measuring & Packaging Co. 36
Fairbairn - Lawson - Combs - Barbour, Ltd. 18
Fales, L. F. 32
Farbenfabriken of Elberfeld Company 227
Fawcett, Hughes 213
Fearon, E., & Co. 26
Feingold, H. & D. 194
Felton, S. A., & Son Co. 20
Ferguson, John W. 196
Firth & Foster Co. 224
Firth, William, Co. 30
Fishkill Landing Machine Co. .. 255
Flossette Mills 217
Ford, J. B., Co. 206
Foster Machine Co.
Outside Back Cover
Friedberger Mfg. Co. 237
Frisco System 50
Garry, Brown & Co. 197
Garland Mfg. Co. 38
Geigy Aniline & Extract Co. 228
Geisenheimer & Co. 191
General Electric Co. 41
Gerry, Geo., & Son ..... —
Gessner, David 186
Gormly, Robert W. & Co. 250
Goulds Mfg. Co. 48
Grant Yarn Co. 217
Grasselli Chemical Co. 231
Graves, Frank B. 220
Green Fuel Economizer Co. 53
Greene & Daniels Mfg. Co. 210
Greenwood, R., & Bault 223
Grosser Knitting Machine Co. ... 243
Haedrich, E. M. 52
Hall, Amos H., Son & Co. 233
Hall, I. A., & Co. 34
Halton's, Thomas, Sons 32
Harding, Whitman & Co. 211
Harper, E. G. 218
Harrisburg Foundry & Mach. Works 198
Hart, Chas. 246
Hartford Steam Boiler Inspection & Insurance Co. 32
Harwood, Geo. S., & Son 24
Heathcote, John, & Son 26
Hepner & Horwitz 250
Hepworth, John W., & Co. 248
Heusch, Severin 221
Heyer, Charles H. 207
Hill, James, Mfg. Co. 29
Home Bleach & Dye Works 224
Hood, R. H. 33
Hooven, Owens & Rentschler Co. 255
Hoffman, DeWitt & McDonough 218
Houghton, E. F., & Co. 49
Houghton, L. T. 13
Howard & Bullough Am. Machine Co. 62
Howson & Howson 197
Hunt, Rodney, Machine Co. ..... —
Hunter, Jas., Machine Co. 23
Hyde, Edward S. 217
Illinois Central 50
India Alkali Works 224
Indian Orchard Co. 212
Ingrahamville Dye Works 223
International Button Co. 251
International Steam Pump Co. .. 48
Irmscher & Co. 241
Ives, Loval T. 252
Jackson, C. L. 198
Jefferson, Edw., & Bro. 196
Jeffrey Mfg. Co. 53
Jenckes, E., Mfg. Co. 238
Jenckes Spinning Co. 217
Johnson, Chas. A., & Co. 51
Jones, Lewis 251
Kalbfleisch, Franklin H., & Co. 230
Kalle & Co. 23
Kaumagraph Company 37
Kenyon, D. R., & Son 21
Keystone Fast Black Dye Wks. 224
Kilburn, Lincoln & Co. 52
Kitson Machine Co. 7
Klauder-Weldon Dyeing Machine Co., The 17
Klein, Chas. C. 52
Klipstein, A., & Co. 225-228
Knapp, Chas. H. 42
Kolb, Frank E. 249
Krout & Fite Mfg. Co. 212
Kuttroff, Pickhardt & Co. 58
Lamb Knitting Machine Co. 247
Lamb, J. K., Textile Mach. Co. —
Lane, W. T., & Bro. 40
Langston, Samuel M. 252
Lawrence Dye Works Co. 223
Leffel, James, & Co. 254
Leigh, Evan Arthur 11
Leighton Mch. Co. 240
Lewis, H. F., & Co., Ltd. 52
Leyland, Thomas, & Co. 15
Lincoln Waterproof Cloth Co. .. —
Lindsay, Hyde & Co. 253
Link-Belt Engineering Co. 12
Little & Walker 190
Lord & Burnham Co. 50
Lorimer, E. D., & Co. 211
Lorimer's Wm. H., Sons Co. 223
Lowell Crayon Co. 27
Lowell Machine Shop 2
Lowell Textile School ..... —
Lunkenheimer Co., The 182
Lupton's, David, Sons Co. 51
Main Belting Co. 46
Malcolm Mills Co. 212
Manufacturers' Supplies Co. 252
Maryland Bleach and Dye Wks. 224
Mason Brush Works 52
Mason Machine Works 4
Mason Regulator Co. 49
Massachusetts Fan Co. 233
Mayo, Geo. D., Machine Co. 236
Mayo Knitting Machine & Needle Co. 235
McCabe, J. J. 35
McCormick & McCormick 197
McKeon, John F. 194
McLeod & Henry Co. 25
McMichael, A. 249
Mechanical Appliance Co. 47
Merrow Machine Co. 238

Metallic Drawing Roll Co. 33
Metz, H. A., & Co. 226
Miller Press & Mch. Co. 26
Mitchell, Jas. E. & Co. 211
Moeller & Littauer 211
Molt Bros. 227
Montgomery, J. R., Co. 210
Monument Mills 210
Moore, C., & Co. 217
Morris & Co. 247
Morse, Williams & Co. 40
Murphy, E. W., & Co. 46
Murray Iron Works Co. 195
Nanz & Co. 52
National Automatic Knitter Co. 250
National Electric Co. 188
Never Slip Cop Spindle Co. 30
New Bedford Textile School 253
New England Butt Co. 29
New York & New Jersey Lubricant Co. 218
New Process Rawhide Co. 48
Nicetown Mfg. Co. 224
Nichols, E. M. 41
Nicol, J. M. & J. S. 233
North Chelmsford Machine Co. 27
North Electric Co., The 220
Norwood Engineering Co. 232
Nye & Tredick Company 236
O. K. Soap Co. 213
Orswell Mills 212
Page Needle Co. 252
Pancoast, Henry B., & Co. 25
Parks & Woolson Mach. Co. ... 27
Paulson, Linkroum & Co. 211
Pawtucket Dyeing & Bleaching Co. 224
Paxton & O'Neill 248
Payne, Geo. W., & Co. 245
Pearson, J. T. 248
Pettes & Randall Co. 220
Philadelphia Drying Mchy. Co... 13
Philadelphia Textile Mchy. Co... 256
Philadelphia Textile School 253
Phila. Water Purification Co..... 44
Phoenix Steam Dye House 220
Pocasset Worsted Co. 214
Providence Machine Co. 29
Providence Mills Company 224
Quaker City Stop Motion Co. ... 245
Queensbury Mills 215
Reeves Pulley Co. 20
Replogle Governor Works, The 255
Richardson Bros. 33
Richter, Wolfgang 250
Riggs & Brothers 26
Riley, C. E. & Co. 181
Risdon-Alcott Turbine Co. 254
Riverdale Woolen Co. 220
Rockwell, E. M. 218
Roessler & Hasslacher Chemical Co. 223
Rome Metal Co. 49
Rowland, Samuel 223
Roy, B. S., & Son 33-45
Ruth Machine Co. 239
Ryle, William, & Co. 216
Saco & Pettee Machine Shops .. 5
Saginaw Mfg. Co. 52
Salem Elevator Works 42
Salkeld, A. D., & Bro. 211
Sargents, C. G., Sons 44
Sauquoit Silk Mfg. Co. 216
Scaife, W. B., & Sons 44
Schaellibaum, The Rob., Co. 45
Schnitzler, Chas. H. 255
Schofield, Geo. L. 196
Schofield, William, Co. 33
Schutte & Koerting Co. 35
Scott & Williams 8
Seaboard Air Line 244
Sellers, Wm., & Co. 42
Shaw, Victor, Ring Traveler Co. 39
Shryock, J. K. 38
Schultz Belting Co. 187
Skerry, A. T., & Co. 215
Slack, Wm. H. H., & Bro. 220
Smith Brothers 253
Smith, Drum & Co. ..... —
Smith, S. Morgan, Co. 200
Smith's Sons Co., John E. 49
Smythe, J. L. N., Co. 38
Solis, Andrew J., Jr. & Co. 213
Solvay Process Co. 230
Southern Railway 51
Speed & Stephenson 197
Spence & Rideout 251
Stafford & Holt 242
Standard Machine Co. 247
Standard Pressed Steel Co. 47
Stead, Arthur 196
Stearns & Castor 196
Steel Heddle Mfg. Co. 46
Stein, Hirsch & Co. 233
Stephenson Mfg. Co. 244
Sternberg, Fred, & Co. 211
Stevens Tank & Tower Co. 232
Stoddard, Haserick, Hathaway & Co. 191
Strouse, Theo. H., & Co. 213
Sturtevant, F. B., Co. 185
Suck, Adolph 196
Sykes & Street 231
Taunton-New Bedford Copper Co. 49
Taylor, Jas. 242
Tebbetts, E. L., & Co. 38
Textile Appliances, Limited 10
Textile Finishing Machinery Co. Inside Front Cover.
Textile Machinery Co. 19
Thayer, Edward M., & Co. 228
Thun & Janssen 38
Thurston, A. G., & Son 212
Tierney, Frank A. 207
Tompkins Bros. 250
Toohey, M. J., & Co. 210
Torrance Mfg. Co. 32
Treat, Orion 252
Tucker, W. & C. F. 43
Tulley, Jas. J. 224
Tupper, W. W., & Co. 51
Union Special Machine Co. 249
Universal Winding Co. 204
U. S. Mill Supply Co. 39
Vacuum Dyeing Mch. Co. 17
Vacuum Process Co. 56
Vila, H. S. 233
Walcott & Campbell Spinning Co. 212
Walder, J. 39
Walther, Otto 241
Walworth Manufacturing Co. Outside Back Cover
Ward & Vandergrift 38
Wardwell Needle Co. 252
Warren Co. 221
Warren Soap Mfg. Co. 43
Weimar Bros. 205
West Indies Chemical Works, Ltd. 233
Westinghouse Electric & Mfg. Co. 57
Whiteley, Wm., & Sons, Ltd. ... 16
Whitin Machine Works 6
Whitinsville Spinning Ring Co... 39
Whiton, D. E., Machine Co. 27
Whittle, J. H. 20
Wickes Brothers 45
Wildman Mfg. Co. 234
Willcox & Gibbs Sewing Machine Co. 243
Woolford, G., Wood Tank Mfg. Co. 232
Woonsocket Mach. & Press Co. 14

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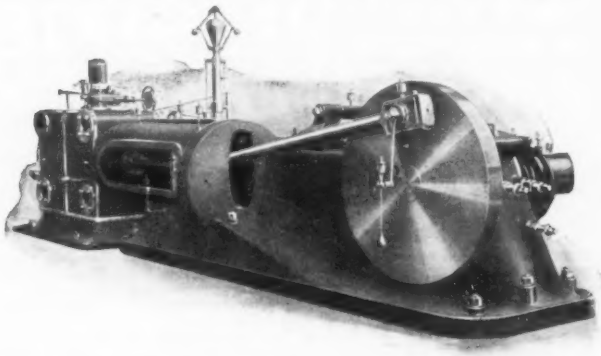

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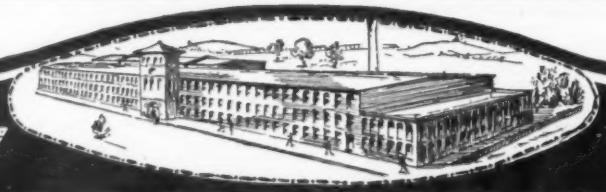

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SITUATIONS WANTED.

Thefollowing advertisements are a portion of those of superintendents and overseers of whom full particulars are on file at this office. Manufacturers who may be in need of such men may address them in care of Textile World Record, or state their requirements directly, and the addresses of suitable men will be furnished without charge.

Any paid-in-advance subscriber may have his name placed on the list of those desiring positions, upon filling out the requisite blanks, furnished upon request. Correspondence is confidential.

COTTON SUPERINTENDENTS.

Superintendent or assistant of silk or cotton mill. Worked on plain and fancy ribbons and all classes of goods in broad silks, dress silks and tie silks, also Jacquard work. References. 3185, Textile World Record.

Asst. Superintendent.. Age 34; American; married. Ribbons of all descriptions, silk and cotton, including labels, tapes and lenos. 3183, Textile World Record.

Superintendent of broad silk mill wants position. Age 39; English; married. Worked on mostly plain goods. Could be of good service to some reliable concern just starting up. Has small plant of his own which he would put in as stock with a first-class concern. 3154, Textile World Record.

Superintendent. Would like position in South. Not particular about salary to start. Machinist and thoroughly acquainted with all kinds of card room machinery, also spinning frames. Taken superintendent course in textile school and has had 23 years of practical experience in the mill, mostly on fine yarn work. 3044, Textile World Record.

Cotton Mill Superintendent. Age 38; Scotch; married. All counts of American and Egyptian cotton from 10 to 60, twist and weft, warps, beams, and bundles and crape yarns, super quality. Familiar with Platt, Asa Lee, Howard & Bullough, Hetherington and Brooks & Doxey machinery. First-class references. 3042, Textile World Record.

Overseer of Cotton Carding. Age 32; married. Carded and combed yarn, fine and coarse, lenos, lawns, shirtings. English and American makes of machinery. References. 3025, Textile World Record.

Cotton Mill Superintendent, or assistant. Age 34; married. Worked on cotton machinery on coarse and medium numbers. Textile school education in designing, carding and spinning. 3003, Textile World Record.

Assistant Superintendent or boss weaver of cotton mill. Twenty-five years' experience. Unquestionable references as to character and ability. Thoroughly acquainted with plain, fancy box or lappet looms. Can take place on short notice. 3034, Textile World Record.

Superintendent of Cotton Yarn Mill or duck mill. A young man; American; married. Prefers position in the South. Worked in different departments, spinning, spooling, twisting, warping, reeling and balling and now ready for a superintendent's place. Unquestionable references. 3087, Textile World Record.

Superintendent. All kinds of fancy cotton, white and colored, plain and fancy, jacquard and box work, also silks and worsteds. Would take good overseer of weaving position. 3120, Textile World Record.

WANTED—POSITION

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Advertiser, Englishman, married, excellent and successful record ; is a practical manufacturer of all kinds of cotton goods, from lowest to finest grades. Address, "R," care of H. Foster, 1221 Allegheny Avenue, Philadelphia Pa.

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Superintendent or Designer. Age 37; American; married. All grades of woolens and also cotton warp goods. Will not go South or to Canada. 3124, Textile World Record.

Asst. Agent, superintendent or mechanical engineer in woolen or carpet mill of any kind. Age 30; married. Excellent references. 3178, Textile World Record.

Manager, superintendent or designer. Age 30; English; married. Experienced in England and in this country. Mohairs, all classes of worsted suitings, plain and fancy dress goods. 3184, Textile World Record.

Superintendent or assistant superintendent wants position. Age 31; American; married. Good experience on all kinds of goods, especially on union and satinets. Good references. Six years' experience in present place, five as overseer and one as superintendent. 3139, Textile World Record.

Superintendent or Designer. Age 37. English. Married. Experienced in this country and England. Worked on cloakings, suitings, coverts, broadcloths, etc. Mill closed, and wants place at once. Good references. 3140, Textile World Record.

Superintendent, manager or designer. Age 37; English; married. Worsted and woolen goods for men's wear and rain cloths. Worked in English mills, and has also been employed in this country. 3103, Textile World Record.

Superintendent, age 34; American; married. Worked on fancy woolens. Not employed, and can take position at once. Will not go to Canada or West or South. Would take a good boss spinner place or assistant superintendent, but wants over $4.00 per day. 3104, Textile World Record.

Superintendent or designer of small or medium sized mill. All kinds of fancy worsteds, cassimeres, cheviots, overcoatings and dress goods. Age 31; married; Scotch. 3076, Textile World Record.

Superintendent or boss weaver. 15 years' experience in worsted, woolen and silk goods. Graduate of Philadelphia Textile School. 32 years old; married. Good manager of help. American. 3119, Textile World Record.

Superintendent. Age 37; American; married. Woolen dress goods, fancy cassimeres, cloakings, etc. Will not go West, South or to Canada. First-class references. Graduate of Philadelphia Textile School, and also had good practical experience. 3126, Textile World Record.

Superintendent and designer, or assistant superintendent. Age 34; married. Worked on cloths ranging from all cotton to all wool and worsteds, such as cotton worsteds, jeans, army cloths, kerseys, etc. Excellent references. 3148, Textile World Record.

Superintendent and Designer. Age 30; American; married. Cotton warp, worsted and silk vestings, tapestry curtains, plaid backs, broadcloth, etc. 3146, Textile World Record.

Superintendent. Age 37; American; married. Woolen dress goods, fancy cassimeres, cloakings, etc. First-class references. Graduate of Philadelphia Textile School, and also 18 years' practical experience. 3126, Textile World Record.

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Overseer of Cotton Carding. Worked on all classes of cotton, carded and combed, in counts to 135s. Will not go West or South. 3061, Textile World Record.

Overseer of Carding or Ring Spinning. Age 35; American. Sheetings, prin s and yarns, coarse and fine. Worked on most American machinery, but is more familiar with Lowell & Whitin. 1915, Textile World Record.

Overseer of Carding or Superintendent. Wide experience in large mills. Age 42; married. Finest of references. Will take large carding or superintendency. Familiar with all counts. 3133, Textile World Record.

Overseer or secondhand in preparatory department of long chain beaming, quilling, tape dressing, warping and spooling. A Scotchman; married. Will not go West or South. 3156, Textile World Record.

WOOLEN CARDERS.

Wanted. Position as boss carder by a thoroughly competent man who has had fifteen years' experience on flannels, cassimeres, knit goods, wool, cotton and shoddy, cotton waste on woolen cards. Has good references as to character and ability. Address, "Boss Carder," Textile World Record, Boston, Mass.

Overseer of Woolen Carding. Worked on all wool, wool and shoddy, wool, shoddy and noils. Wants $4 a day. Familiar with Davis & Furber, Furbush, Lombard and Bollette and Brown Patent. 3071, Textile World Record.

Overseer of Combing, washing, carding. Age 36, English, married. All classes of wool. Good experience and first-class recommendation. 3094, Textile World Record.

Overseer of Woolen Carding. Would accept secondhand position. All wool, cotton and wool, shoddies, mixes, worsteds. Does not wish for position on shoddy, but would consider one. Blankets, suitings, flannels. Understands spinning. 3093, Textile World Record.

Carder and Spinner. Been overseer 32 years, making every variety of cassimere, flannels, overcoatings, cloakings, dress goods, etc. Married; American. 3132, Textile World Record.

Overseer of Carding. Age 30; American married; Nearly all classes of goods. Good experience and references. Address 3170, Textile World Record, Boston.

Boss Carder. Union cassimeres, beavers, French. First-class recommendations. Not employed, and wants place at once. 3174, Textile World Record.

COTTON SPINNERS.

Overseer of Mule Spinning who has had a wide experience in large New England mills on yar ranging from 24's to 160's is open to a position. .. years old; American. Good references. 2003, Textile World Record.

Overseer Ring Spinning, or asst. superintendent. Sea Island combed from 6s to 30s, American from 6s to 50s; in fact, all grades of cotton, also expert on cable yarn. Prefers South, but will go anywhere. Wants $3.50 per day to begin with. 2020, Textile World Record.

Overseer of Ring Spinning. Aged 42; American; married. Ginghams, sheetings, awnings, denims, etc.; $3 to $4 per day. 3018, Textile World Record.

Overseer of Cotton Mule Spinning. Understands Mason and English makes of mules. Has worked in mule room sixteen years, five years as second hand and a year and a half as overseer. 28 years old; married; steady and temperate. Would like to get work in N. E. or New York states. Has worked on colored hosiery yarn and filling. 1822, Textile World Record.

Overseer Ring Spinning, spooling and warping wishes a position. A married man, with good experience. Worked on sheetings, shirtings, jeans, grain bags. 3152, Textile World Record.

Supt. of Cotton Mill, or overseer of mule or ring spinning is open to a position; 16 years' experience in Northern mills, on yarns, denims, awnings, apron checks, bicycle suitings, shirtings, etc., etc. Familiar with all well-known makes of cotton machinery; 29 years old; American; married. Can give references from large Massachusetts mills. 1527, Textile World Record.

Overseer of Cone Winding and spooling or ring spinning, who understands Universal, Foster, Broadbent and Payne winders, and Whitin and Mason frames, desires a position. Has worked on carded and combed yarns from 4's to 160's; also, mercerized, gassed and bleached yarns from 2 to 8 ply. Young man; American; married, and can give satisfactory references from large mills. 1960, Textile World Record.

Overseer of Spooling, warping, beaming, slashing and web drawing. Age 37; married. 3010, Textile World Record.

Overseer of Spinning. Age 34; married. Good experience. 20s to 90s Egyptian and American cotton. 3125, Textile World Record.

WOOLEN SPINNERS.

Roll Coverer wants an opening for work. Can cover cotton or worsted rolls, make aprons, or better, has had large experience. Can furnish tools. Work by piece or day. 1803, Textile World Record.

Superintendent woolen mill. Age 47; English; married. Wants New England or Middle States. 10 years' experience in first-class N. E. mills. 2028, Textile World Record.

Overseer of Warping, Spooling and Winding. Dress goods and cloth. Will not go to Canada. Aged 40; married. Good experience. References. 3027, Textile World Record.

Woolen Finisher. First-class. Familiar with all classes of goods and machinery. Can take full charge from loom to case. Has always been very successful. 1244, Textile World Record.

Boss Spinner. Age 34; Scotch. Worked on all wool, cotton and wool and shoddy mixes. Will not go West, South or to Canada. References. Good experience. 3032, Textile World Record.

Overseer Woolen Spinning. Cassimeres, beavers, kerseys, dress goods, flannels, etc. Good experience. 3177, Textile World Record.

COTTON WEAVERS.

Superintendent of cotton weaving and spinning mill. English. Quilts, damasks, brocades, ribbons, etc. 3175, Textile World Record.

Overseer of Weaving. Age 38; English. Worked on muslins, lawns, drills, tapestry, etc., Wants not less than $4 per day. 3179, Textile World Record.

Overseer Cotton Weaving. Plain and a variety of fancies, lenos, etc. Good experience. A young man; English; married. 3147, Textile World Record.

Overseer of plain cotton weaving. Age 27; American; married. Familiar with Whitin Mason, Colvin and Draper looms. Worked on prints, sheetings, cambrics, lawns, twills, etc. 3143, Textile World Record.

Overseer of Weaving. Sheetings, sateens, ginghams, and dimities. Will not go South. 3116, Textile World Record.

Overseer of Weaving. Worked on sheetings, twills, sateens and fancies. Wants not less than $18 per week. 3157, Textile World Record.

Practical Boss Weaver and loom fixer wants position. Good and long experience. Good record for big production; good quality and for being a good manager of help, and the getting and keeping plenty of good hands. A sober and steady man. Will go anywhere. Either cotton, woolen or jute. 1806, Textile World Record.

WOOLEN WEAVERS.

Overseer of Weaving, also designer. Men's wear, woolen and worsted, and fancies of all kinds, cotton worsteds, dress goods. Knowles and Crompton looms. Age 35. 3056, Textile World Record.

Overseer of Weaving, or would take good second hand job. Age 42; married. Worked on dress goods, suitings, plaid backs, cloakings, meltons and other classes of goods. Worked on Crompton & Knowles loom. 3016, Textile World Record.

Boss Weaver or assistant superintendent. Worked on all kinds of worsteds and woolens. Crompton & Knowles looms. Wants place at once. Middle aged; English; married. Good experience. Excellent references. 3062, Textile World Record.

Boss Weaver. Aged 38; married. Cassimeres, beavers, kerseys, dress goods, flannels, blankets. Worked on Crompton & Knowles broad looms. Good recommendation. 3066, Textile World Record.

Overseer of Woolen Weaving, or would take a secondhand job. 35 years old; married. Familiar with Crompton & Knowles looms. Good references. 3089, Textile World Record.

Overseer of Weaving or designer. Age 29; American; married. Thibets, meltons, kerseys, worsteds and cotton worsteds. Crompton & Knowles looms. Good experience. First class recommendation. 2051, Textile World Record.

Overseer of Weave Room, designer or assistant superintendent. Wide experience. Cassimeres, dress goods, blankets, flannels, etc. All patterns of Knowles & Crompton looms, Davis & Furber, spooling, dressing and weaving machinery, Worcester warp compressor. 1838, Textile World Record.

Boss Weaver, second hand or loom fixer. Age 30; married. Wants $3 per day. Men's wear, dress goods and all kinds of fancy worsteds. Crompton & Knowles looms. Reference. 3182, Textile World Record.

Boss Weaver and designer. All grades of fancy dress goods, woolen and worsted, cotton and cotton mix kerseys, coverts and venetians. Plain and fancy men's wear. 3181, Textile World Record.

Boss Weaver wants position. Very wide experience. White and colored, plain and fancy. Understands all kinds of looms. 335, Textile World Record.

DYERS.

Secondhand Dyer. Cotton piece and cotton interwoven with paper. Experience with all classes of goods on a small scale. Aged 23; German descent; unmarried. Address 3171, Textile World Record, Boston.

Wanted. Position by First Class Dyer. Fifteen years' experience on raw stock, wool, cotton, shoddy, cross dyes and all kinds of piece dyeing. Age 35 years. Temperate and good manager of help. First class references. Address Box 28, Textile World Record, Boston.

Dyer or superintendent of dyeing and finishing. Age 34; English; married. Not less than $3.50 per day. All classes of woolen, worsted, mixed and cotton piece goods, bleaching, mercerizing. Can take charge from loom to case. 3121, Textile World Record.

Boss Dyer in a 3 to 5 set mill, or secondhand dyer, Raw stock and shoddy. Wants Mass., R. I., or Conn. 3187, Textile World Record.

Boss Dyer in woolen mill. Would consider a good second hand job. Worked on broadcloths, dress goods, raw stock. Won't go South or to Canada. 3180, Textile World Record.

Superintendent of cotton bleachery is open to a position. Excellent experience. American; married; aged 37. Familiar with cambrics, sheetings, shirtings, lawns, sateens, drilling and fancy weaves. 3153, Textile World Record.

Fancy Dyer. Aged 37; American; married. Cotton, wool and silk. 3158, Textile World Record.

Overseer of Dyeing. Men's wear and dress goods, loose wool, piece dyes and yarns. Good experience. 3161, Textile World Record.

Dyer. Worked on piece dyes, wool, cotton, shoddy yarns, rags and union dyes and carbonizing. Wants place at once. Good experience and references. 3092, Textile World Record.

Wanted, position as boss dyer and bleacher of cotton yarns, long and short chain and skein yarn. Good references. 3145, Textile World Record.

FINISHERS.

Finisher and assistant superintendent wants position. Age 31; American; married. Good experience on all kinds of goods, especially on unions and satinets. Good references. Will not go West, South or to Canada. 3139, Textile World Record.

Boss Finisher. 25 years' experience on all classes of goods, woolen and worsted and cotton mixtures of all grades. 3142, Textile World Record.

Boss Finisher. American. Cheviots, cassimeres, beavers, dress goods, etc. Wants $2.50 to $3 per day. 3123, Textile World Record.

Overseer of Finishing. Age 32; American; married. All grades of worsted and woolens. Good experience. Address 3167, Textile World Record, Boston.

Overseer of Finishing Room. Cut and full fashioned balbriggan ribbed goods. Familiar with Union Special, Wheeler & Wilson, Willcox & Gibbs, Merrow, etc. Excellent references. Address 3168, Textile World Record, Boston.

Woolen Finisher. Age 35; American; married; Wants $2.50 or $3.00 per day. Good experience. 3138, Textile World Record.

Overseer of Cloth Room. Age 37; American; married. Wants $18 per week or over. 3110, Textile World Record.

Overseer of Finishing. Age 33; American; married. Meltons, coverts, cheviots, flannels, mohairs, etc. Wants position in New England, preferably Rhode Island. 3129, Textile World Record, Boston.

Foreman of cotton finishing room. Eight years' practical experience on napping machines, starching and calendering. Worked in mills in Italy and America. Married. 3155, Textile World Record.

KNITTERS.

Boss knitter, sewing machine fixer. Age 28; American. All classes of ladies' and children's knit underwear made on circular latch needle machines. Wants place at once. 3102, Textile World Record.

General Manager or superintendent of ribbed underwear mill. American; married. Been in underwear business eleven years as superintendent and manager. First-class references as to character and ability. 3100, Textile World Record.

Latch Needle Knitter on N. & T., S. & H., S. & W., McM. & W., Pepper, Lewis Jones, etc., circular machines. Twelve years' experience as boss knitter and superintendent. Wants steady work. Sober, good manager of help, best of references. 3106, Textile World Record.

Boss Knitter or fixer. Would like to work with boss finisher on sewing machines. American; age 32. Familiar with McMichael & Wildman, Nye & Tredick, Snyder & Fisher, Scott & Williams and other makes of latch needle machines, Tompkins spring needle machines, and understands winding. 3118, Textile World Record.

Position wanted in charge of boarding, pressing, pairing, folding of hosiery, etc. First-class references. 3105, Textile World Record.

Knitter. Worked on light and heavy weight ladies' ribbed vests and shaped vests, and all kinds of common knit goods. Familiar with Champion, Nye & Tredick, Star, McMichael & Wildman machines. Wants work in Pennsylvania. 3037, Textile World Record.

Superintendent of an underwear mill. English; married; middle aged. 3176, Textile World Record.

Boss Knitter or foreman, for seamless hosiery. Several years' experience on all grades, and understands the fixing and care of most all kinds seamless hosiery machinery. 3078, Textile World Record.

Boss Knitter or Sewing Machine Fixer. German; married. Familiar with all makes of knitting and finishing machines on ladies' underwear. Will not go South or to Canada. 3128, Textile World Record.

Superintendent or Manager of large hosiery yarn mill will be open to a position shortly. American; married. Has manufactured in the South hosiery yarns in natural stats, mixtures, silver grays, bleached and colored. Can refer to influential men. 1961, Textile World Record.

Superintendent. All grades and weights of hosiery and ladies' ribbed underwear. Is familiar with Standard, Boss, Nye & Tredick and Branson machines. 598, Textile World Record.

Latch Needle Boss Knitter

Wants Position. Ten years experience. Any class ribbed goods. Any make of machines. Two years on sewing machines. References. Address "Latch Needle," Textile World Record, Boston, Mass.

PRACTICAL SUPERINTENDENT OF KNITTING MILL

Open for position as superintendent. Can furnish best of reterences. Address "Practical Superintendent," care Textile World Record, Boston, Mass.

Boss Knitter or second hand on flat work. Thirty years of age; married. Experienced on balbriggan, fleece lined and non-shrinkable goods, using black face thread and a white cotton thread on back and keep the cotton from showing on face. Address, "Flat," Textile World Record, Boston, Mass.

Superintendent of Knitting Mill

Thoroughly experienced on Standard Automatic Knitters, Ribbers, Loopers, Etc. Also well experienced in the finishing of hosiery. Desires a steady position with mill with a production of 300 to 600 dozen per day. Misses ribbed hose preferred. Or will contract with firm from six months to one year, to teach any local man the business. Have had 10 years experience on Standard machines. Can furnish best of references. Address "Knit" care Textile World Record, Boston, Mass.

DESIGNERS.

Designer. Position Wanted by first-class designer with 14 years' practical experience on worsted, cotton and silk dress goods, dobby and jacquard work, also upholstery goods, bedspreads and table covers. Experienced in German and American Mills. Graduate of Textile School, German, 28 years old, married. Best references. At present employed. Address G. 100, care of Textile World Record, Boston, Mass.

Designer. Position wanted. Age 25; unmarried. Familiar with men's wear, woolen and fancy worsteds. Graduate of a prominent textile and designing school in Germany. Address Bernhard Fischer, 37 Carver St., Boston, Mass.

Wanted. Position as designer or assistant. Has had experience in Maine and Canada. Has worked on Marseilles, Sateen and Crochet spreads, table covers of every description, leno, lappet and plain gingham work. Will work anywhere in the United States. 3107, Textile World Record.

Designer, assistant superintendent or boss weaver and dresser. Age 32; Scotch; married. Eighteen years' experience in woolen mills. Have worked in all departments, overseer several years. Textile graduate, worked on all grades of worsted and woolen suitings and overcoatings. 3076, Textile World Record.

Designer. Age 29; American. Understands Jacquards and would like to get into a mill making ladies' dress goods, etc. 3186, Textile World Record.

Designer or superintendent. A German, 26 years of age. Dress goods and men's wear. Experienced in Germany and this country. 3163, Textile World Record.

Assistant Designer or assistant superintendent of woolen or worsted mill. A young man; American; unmarried. Men's wear, dress goods, silk brocades, damask, etc. 3160, Textile World Record.

Designer, assistant designer or assistant superintendent. German. Woolen and worsted men's wear and ladies' dress goods. Experienced in Germany and a short time in this country. 3166, Textile World Record.

Designer or superintendent. Ginghams, crepe, jacquards, cycle tires, filter cloths, vesting cloth, etc. Good recommendations. Middle aged man; English; married. Address 3169, Textile World Record, Boston.

Jacquard Designer wants position or temporary work. Prefers designing for Jacquard blankets if possible. 3167, Textile World Record.

Designer for cotton, worsted and silkoline dress goods and cotton trouserings, etc. A young man; American. 3173, Textile World Record.

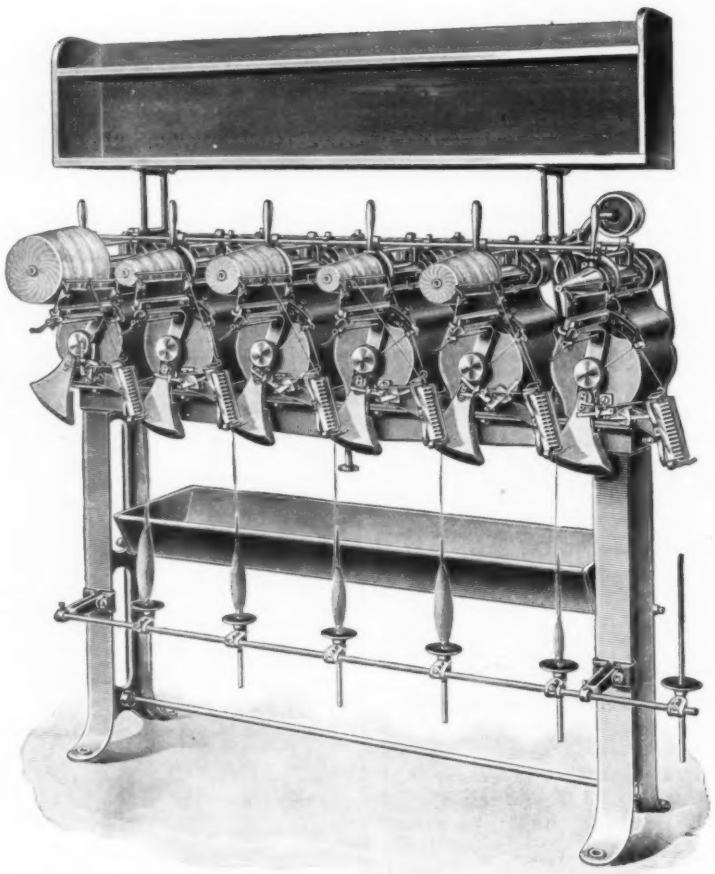
MISCELLANEOUS.

Asst. Superintendent of dyeing, printing and finishing plant. Experienced in cotton and silk and capable of turning out finished product. American; 27 and married. Best of references. 3136, Textile World Record.

Second Boss or in advisory capacity for jacquard weaving. Familiar with almost every line of silk fabrics, also cotton backs, tapestry and upholstery goods, hammocks, table and bed covers, ribbons, etc. 3135, Textile World Record.

Loom Boss or asst. superintendent. All kinds of worsted goods for ladies' and gentlemen's wear and various classes of cotton goods. Worked in English mills and also in this country. 3151, Textile World Record.

Mechanical Superintendent and master mechanic of cotton and cotton finishing mill desires position. Mechanical engineer, technical graduate with broad experience in mill construction, maintenance and management, power plant installation, power transmission and design and construction of machinery. Best of references. Address "Mechanical," Textile World Record, Boston, Mass.



Speaks for itself on Coning, Tubing and Doubling

Universal Winding Company
95 SOUTH STREET, BOSTON

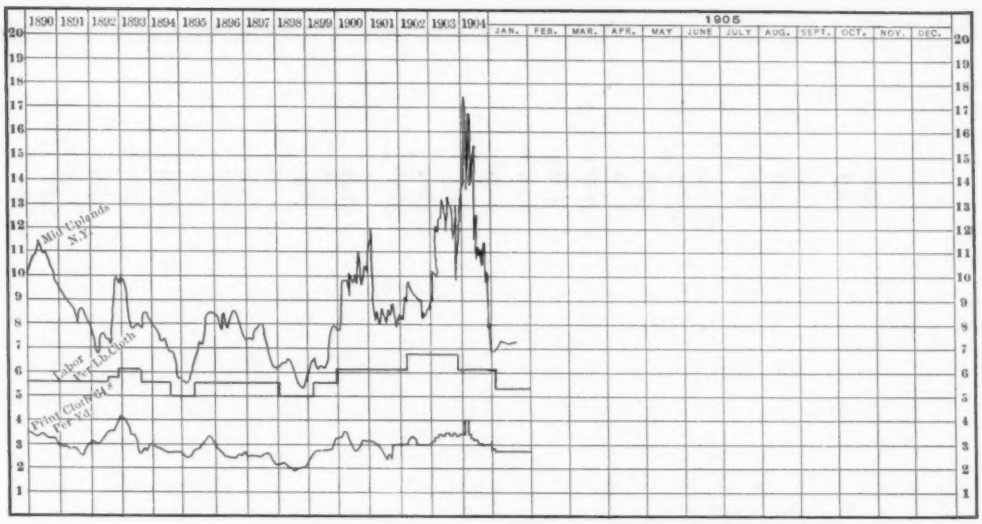

1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904
1905
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
Mid Uplands N.Y.
Labor Per Lb. Cloth
Print Cloth 64 Sq. Yds.

CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

The Cotton Market.

Low prices have had a pronounced effect on the movement into sight and buyers have found Southern owners of cotton unwilling to part with their cotton at going rates. The increase in the wealth of the South has enabled the planters to maintain this position more easily than in former years, and this ability, which will doubtless increase with time, will tend to reduce the wild fluctuation of prices and the erratic movement of the crop. The movement into sight from Sept. 1 to Jan. 20 for a series of years is reported by the Chronicle as follows:

1899-00	6,578,819 bales.
1900-01	7,360,432 bales.
1901-02	7,632,769 bales.
1902-03	7,664,692 bales.
1903-04	7,725,011 bales.
1904-05	8,448,125 bales.

Speculation in cotton has been quiet and the spot market dull. The project to raise prices by burning cotton resulted as might be expected in a country with a majority of its population in a state of sanity. Among 80,000,000 people it is possible to get a considerable number of noisy adherents for any proposition.

The world's visible stock of cotton as reported by the Chronicle on Jan. 20, amounted to 4,562,715 bales; as compared with 4,040,043 bales at same time in 1904; 4,070,028 bales in 1903; and 4,412,791 bales in 1902.

The Maple Cotton Mills, Dillon, S. C., who are making extensive additions, practically doubling their present plant, have placed their entire order for picking, card room and spinning machinery with the Howard & Bullough American Machine Co., Pawtucket, R. I.

James Ferguson has gone to Greensboro, N. C., to superintend the erection of cotton machinery manufactured by the Whitin Machine Works.

J. F. Scott who has been superintendent of the Mississippi Cotton & Woolen Mills the past several months, has resigned, and F. A. Abbott, formerly superintendent of the Meridian Cotton Mills, will succeed him.

C. M. BLAISDELL, Pres. and Treas. G. A. BLAISDELL, Vice Pres. and Sec'y.
Established 1860—Incorporated 1893.
THE S. BLAISDELL, JR., CO.,
COTTON, EGYPTIAN PERUVIAN
American Long Staple a Specialty. Shipments direct to mill from Egypt, Peru and all American Southern Points.
CHICOPEE, MASS.
Cotton Waste Purchased on Yearly Contract from Mills.

WEIMAR BROS. MANUFACTURERS OF Cotton Mercerized Tapes,
SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES.
Phone Connections. Works, 2046-48 Amber Street. PHILADELPHIA, PA.

I am getting results

To be sure every mill man is getting results, but are you getting the best results possible?

You are buying a certain grade of wool at a fixed price. You scour this wool, but how? It is in the scouring process that most wools are cheapened. Strong alkalies (soda ash and pure alkali) take from the tender wool fibre its life, its elasticity, its natural properties, leaving it harsh and dead. You have lowered the quality of your wool.

Wyandotte Textile Soda

is a product manufactured especially for scouring wool and finished cloth. It is entirely different from all other soda products. It in no way affects the wool fibre or injures any of its natural properties, yet it possesses detergent properties of exceptional value.

Wool scoured with Wyandotte Textile Soda possesses that softness, whiteness and and loftiness desired by all mills. Just try it. Order from your supply house.

None Genuine except with a card bearing this Trade Mark

In Every Package.

The J. B. FORD CO.,

Sole Manufacturers,

WYANDOTTE, MICH.

This Soda was awarded the highest prize — Gold Medal — at the St. Louis Exposition.

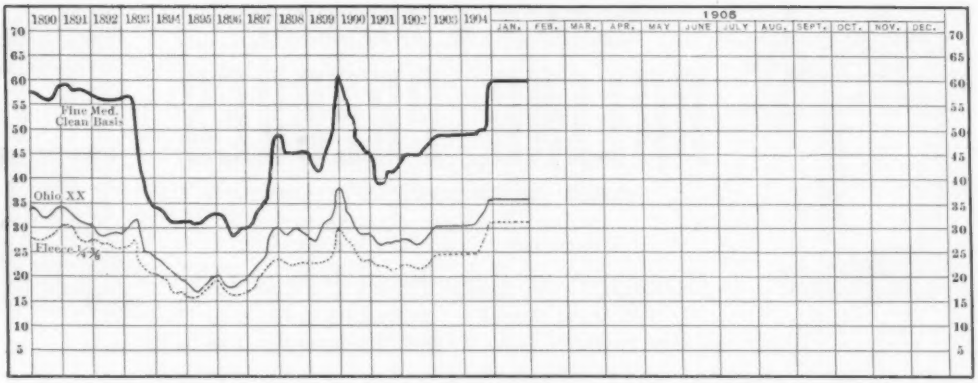


CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

The Wool Market.

Prices have been firmly maintained with small sales during the past month. Both conditions are due to the same cause, small stocks. While some allowance must be made for the desire of holders to leave the impression that the available supply is down to the vanishing point, it is unquestionable that the stock of wool is smaller than at any similar period for many years.

Dealers are contracting for the new clip and it is estimated that at least a third of the 1905 domestic production of wool is so covered at prices that in some cases are in excess of the quotations prevailing at the seaboard.

The foreign market is firm, although it has not shown the advance that some enthusiastic traders predicted. The imports of wool have been in large volume, but manufacturers have not taken the wool freely because of its high cost and the additional fact that users of foreign wool have their orders covered for some time to come.

The goods market has advanced in response to the high cost of wool, the plain goods of the American Woolen Co. having been opened at advances ranging from 10 to 15 per cent. This substantial increase is not out of proportion to the advance in wool, although it gives a larger profit to manufacturers who bought wool early. The larger manufacturers did this, but many of the medium sized and smaller concerns delayed purchasing raw material until after the advance in wool, and as a result find themselves now facing as narrow margin of profits as before the advance in goods.

W. H. Buckley, formerly superintendent of the New Dam Woolen Mill, Somersworth, N. H., has accepted a position as superintendent of the plant of the Rochester Woolen Co., Rochester, N. H.

Harry H. Whertley, overseer of carding in Mill No. 1, Knoxville, Tenn., Woolen Mills, has severed his connection with the same, owing to poor health of his family and has returned to Philadelphia. George Asquith, Jr., succeeds him.

William Barker, recently boss dyer for the Bemis Mills, Watertown, Mass., has resigned to take a similar position with the Watertown Woolen Co., Watertown, N. Y.

Wool and Woolen Goods Made **NONSHRINKABLE** by the use of "Nevershrink Process."

May be applied at any stage of manufacturing. Write for Booklet.

CHARLES H. HEYER,

1501 Real Estate Trust Bldg. Philadelphia, Pa.

FOR WOOL Nevershrink Process

STANDARD QUALITY COMBED RAMIE TOPS and NOILS a Specialty. RAMIE YARNS in All Numbers for All Purposes.

Wool, Mohair, Camel Hair, Silk, and Ramie Tops and Noils.

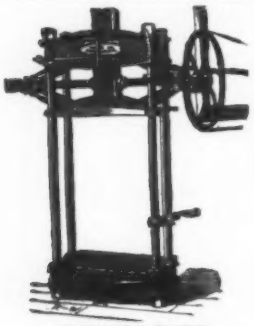
FRANK A. TIERNEY,

Wool, Tops, Noils, Yarns.

Woolen, Worsted, Mohair, Ramie and Silk Knitting Yarns.

All Kinds of Yarn for Weaving Purposes. Special Fibres and Novelties for Woolen, Cotton and Silk Manufacturers.

Room 203, Wool Exchange Building, 260 West Broadway, New York.



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BOOMER & BOSCHERT

BALING PRESSES

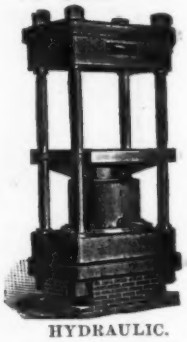
ARE THE STANDARD

Hydraulic or Knuckle Joint
Any Size .. Any Power

Boomer & Boschert Press Co.

338 West Water S., SYRACUSE, N. Y.

Southern Agent, A. H. WASHBURN, Charlotte, N. C.



HYDRAULIC.

De Haven's All Steel Spinning Travelers.

FIG. 1.

FIG. 2.

Fig. 1 shows De Haven's all steel travelers. Fig. 2 shows case-hardened iron travelers. Which is best? We leave it to the common-sense of the spinner.

Insist upon getting **De Haven's High Carbon Steel Travelers** and you will produce better yarn and more of it for the same money.

De Haven Mfg. Co.,

50 Columbia Heights, BROOKLYN, N. Y.

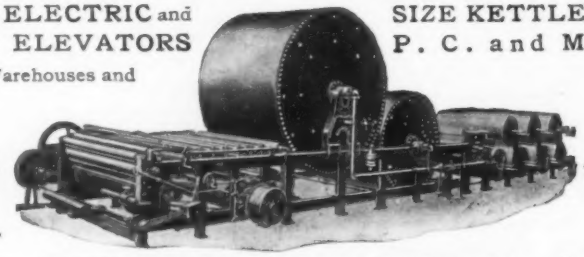
The COHOES SLASHER.

BELT-DRIVEN, ELECTRIC and HAND-POWER ELEVATORS

For Cotton Mills, Warehouses and Factories.

PULLEY BLOCKS.

OVERHEAD TRACKS.



SIZE KETTLES. REPAIRS for P. C. and M. MULES and EMPIRE LOOMS.

WATERWHEEL GOVERNORS.

The COHOES IRON FOUNDRY & MACHINE CO. Cohoes, N. Y.

A Rigid Examination Reveals No Defects in the

CROSBY SPRING-SAVE GLOBE AND ANGLE VALVE.

NO BETTER VALVE CAN BE MADE.

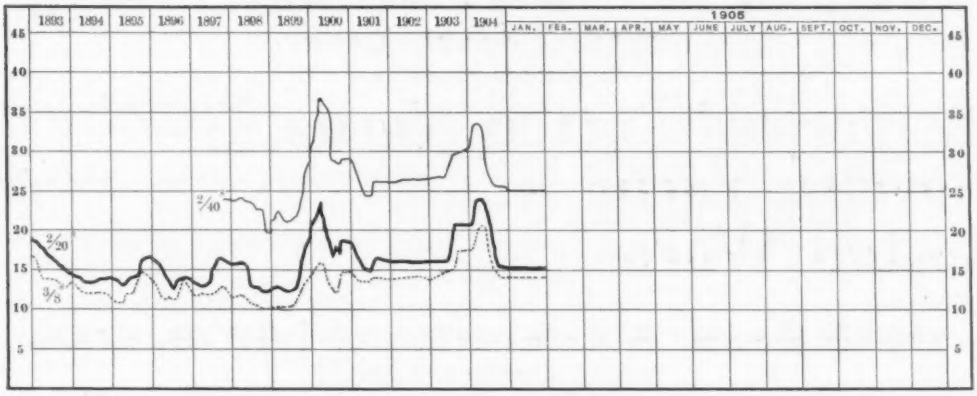
All Working Parts Renewable Without Removal from Piping. ALL PARTS INTERCHANGEABLE. THEY have a full opening through them. WHEN COMPLETED ARE TESTED under more than 400 lbs. pressure. We guarantee them NOT TO LEAK AT HIGH PRESSURES. MADE IN BRASS AND IRON in the various styles furnished to the trade. **Try One or More Valves and BE CONVINCED.**

CROSBY STEAM GAGE AND VALVE CO.

Stores: BOSTON, NEW YORK, CHICAGO, LONDON.

Office and Works: BOSTON, MASS.

Yarn Department.



GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

The Eastern Yarn Market.

A fair volume of business both for spot and future business has been done in cotton yarn during the past month. The improved demand for goods and the reduction of prices on yarn to correspond with the drop in cotton is responsible for this condition. There is a general belief that cotton is on the bargain counter and that any change from the present level of values is likely to be in the direction of an advance. This would strengthen the goods market and buyers are not disposed to run great risks in leaving their requirements uncovered by contracts at going prices. There has been considerable friction between spinners and some of their customers who are under contract to take yarn at the higher prices that prevailed a few months ago. In a few cases the customers have refused to accept deliveries; in others there have been complaints as to quality, but these disputes are but a natural consequence of the process of readjustment to new price conditions.

Eastern Cops.

6's	15
8's	15
10's	15¼
14's	16¼
16's	16¾
18's	17¼
20's	17¾
22's	18¼
24's	18¾
26's	19¼
30's	20¼
34's	21¼
36's	21¾
40's	22¾

On cones, ¾c. more up to 14's; 1c. more from 15's to 22's; 1½c. from 23's to 35's, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12's	17
14's	17½
18's	18½
20's	19½
24's	21
26's	22
30's	23
36's	24
40's	25
45's	29
50's	33
55's	37
60's	41

Eastern Two-Ply Warps, Carded Peeler.

2/30's	23
2/36's	24
2/40's	26
2/45's	30
2/50's	34
2/60's	42

Egyptian Weaving Yarns.
Single Skeins Combed.

30's	33
36's	35
40's	37
45's	39
50's	42
55's	45
60's	48
70's	57

Two and Three Ply Skeins, Combed.

30's	34
36's	38
40's	40
45's	42
50's	46
55's	49
60's	53
70's	63

Carpet Yarns.

60-yd. double reel filling	29
No. 2 60-yd. double reel filling	28½
1st quality ⅝	24
2d quality ⅝	23

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

Colored and Bleached Yarns Furnished in any manner desired by the trade.

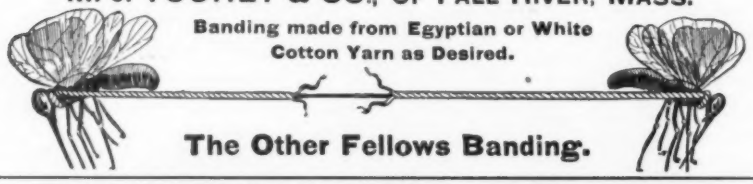
Pawtucket, R. I.

THESE MULES CANNOT BREAK THE BANDING

—MADE BY—

M. J. TOOHEY & CO., OF FALL RIVER, MASS.

Banding made from Egyptian or White Cotton Yarn as Desired.



The Other Fellows Banding.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double Twist

COTTON WARPS

HOUSATONIC, MASS.

4s to 60s.

Dana Warp Mills

WESTBROOK, ... MAINE

White and Colored Warps 6s to 50s Single and Ply

Mule Cops From 30s to 50s from American & Egyptian Cotton

60-yd. double reel filling skeins	10
(on cops)	11
120-yd. single reel cotton (on cops)	11
Wool ingrains, 42-yd. common	7
medium	8-8½
best	11½
extra best	15
light supers	18½
Super jute, 42 yard	7½
Super jute (light), 42 yard	7½-8
Velvet wool, spun, 135 yds., white	34
Gray	33

Philadelphia Yarn Market.

The cotton yarn market the past month has been rather lifeless, with prices gradually softening. The best business has been done on spot delivery orders, but since prices have reached their present level there have been a good many orders placed for future delivery. The cotton market has been fairly steady for several weeks, and holders of cotton in the South are keeping the better grades off the market. Spinners who require the higher grades of cotton all report that there is very little of this class of cotton being offered, and the only way to get it in any quantity is to pay a premium on current quotations.

The movement to hold cotton is general throughout the South and it will probably have a good effect in steadying prices. There is also a feeling among manufacturers that there will be a better demand for goods soon. Stocks in the hands of jobbers are comparatively low. Yarn merchants have experienced some trouble and annoyance the past few weeks with customers who have tried to repudiate contracts placed for yarn at high prices, but the most of the trade are living up to their contracts and recognize the fact that they must take their high priced yarn. There are rumors of several large law suits against knitters and weavers who have tried to cancel high priced contracts.

Southern frame spun cones:—

7's and Coarser	14½-15
8's and 9's	14½-15
10's	15
12's	15½
14's	16
16's	16½
18's	17
20's	17½
22's	18
24's	18½
26's	19
30's	20
40's	25
50's	31

Southern high grade mule yarn:—

	Cones.
10's	16
12's	16½

PAULSON, LINKROUM & CO.
Successors to BUCKINGHAM, PAULSON & CO.
Commission Merchants
COTTON YARNS of all Descriptions
83 Leonard St, NEW YORK
302 Chestnut St., Phila. 210 Munroe St., Chicago, Ill.
Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited.

JAMES E. MITCHELL CO., COMMISSION MERCHANTS.
Cotton Yarns
FOR ALL PURPOSES.
122-124 Chestnut Street, PHILADELPHIA, PA.
Brown Building, 185 Summer Street, BOSTON, MASS.

CATLIN & CO.,
Cotton Yarns
345 Broadway, NEW YORK.
67 Chauncy Street, BOSTON.
206 Chestnut Street, PHILADELPHIA.
605 Medinah Temple, CHICAGO.

Harding, Whitman & Co.,
Dry Goods Commission Merchants,
COTTON AND WORSTED YARNS.
BOSTON. NEW YORK. PHILA.
CHICAGO. BALTIMORE. ST. LOUIS.

A. D. SALKELD & BRO.,
With FRED'K VIETOR & ACHELIS,
YARNS.
66-72 LEONARD STREET, - NEW YORK.

Fred Sternberg & Co.
530 Broadway, - NEW YORK.
MERCERIZED TURKEY RED GASSED } COTTON YARNS.

E. D. LORIMER & CO.
COTTON YARNS } ALL NUMBERS
MERCERIZED YARNS } FOR ALL PURPOSES
346 BROADWAY, NEW YORK.

MOELLER & LITTAUER,
SILK, WORSTED, WOOLEN YARNS COTTON AND MOHAIR
Polished Threads and Tinsel. Artificial or Wood Silk.
Mercerized, Turkey-Red, Fine Gassed Yarns.
109 GREENE ST., NEW YORK

CAPACITY, 50,000 Spindles. **ORSWELL MILLS** FITCHBURG, MASS.

COMBED **COTTON YARNS** CARDED

In Chains and Skeins, on Balls, Beams, Spools—Single or Twisted.

THE MALCOLM MILLS CO.,

MANUFACTURERS OF

FANCY YARNS and POLISHED THREADS.

Offices: 229 Chestnut St., Philadelphia.

Mills: Frankford, Pa.

KROUT & FITE MANUFACTURING CO.,

Manufacturers of

Silk, Cotton and Mercerized Narrow Fabrics

Spool Tapes a Specialty.

Telephone Connection. Office and Mill, Allegheny Ave. and Emerald St., PHILADELPHIA.

Walcott & Campbell Spinning Co.

Fancy Hosiery Yarns

IN ALL COLORS

New York Mills, Oneida Co., New York

A. G. THURSTON & SON,

MANUFACTURERS OF

Fluted Rolls, Pressers for Flyers

AND GENERAL MACHINERY

Specialties made of Renecking, Refluting, Filing and Honing of all kinds of Rolls. Flyers Repaired and Fitted with any desired style of Pressers, Spindles Straightened Restepped and Retopped.

Box 528. FALL RIVER, MASS

Indian Orchard Company

Cotton Warps and Yarns. In Gray and all Colors, Single or two or more Ply, and Cable Cord.

Novelty Yarns. in Various Patterns, Colors and Twists.

Carded and Colored Cotton. For Mixing with wool. Machined or in Roving.

Indian Orchard, Mass.

E. MORGAN, PRES. H. K. WRIGHT, TREAS. W. C. GODFREY, AGT.

14's	17
16's	17¾
18's	18¼
20's and 22's	18¾-19½
24's	20
Southern frame yarn, lower grades:—	
6's and 8's	14½
10's	15
Eastern cones (high grade quality):—	
10's	16½
12's	17
14's	17½
16's	18¼
18's	18¾
20's and 22's	19¼-19¾
Skein yarn (mostly Southern):—	
4's to 8's soft	14½
10's to 12's	15
14's to 20's	15½-16½
22's	16½
14/2	16
16/2	16¼
20/2	16½
30/2	18½
40/2	24-25
16/3 slack	16-16¼
12/3 slack	16
8/3 carpet	14½
8/3 slack	14½
9/4 slack	14½
Warps (mostly Southern):—	
10's to 12's	15½
14's	16
16's	16½
20's to 22's	17-17½
26's	18
14/2	16½
16/2	16¾
20/2	17
24/2	18
30/2	19
40/2	24
Mixed colored yarns (mock twist, half colors):—	
6's to 10's	15½-16
12's to 14's	16½-17
16's to 18's	18-19

Silver and jaeger, 1½c. over white.

Mock Egyptian, 2c. advance over white.

Egyptian, 4c. to 5c. above best quality white.

Worsted Yarn.

The majority of the spinners are not busy. All of them (to use a stock jobbing term) are long on orders and short on spinning instructions. Many of the weavers when they realized that worsted yarn was advancing placed blanket orders. That is, they bought yarn on a basis of grade, certain numbers in that particular grade to cost a certain amount. So far few if any spinning instructions have been given and will not be given until the heavy weight season is fully under way. It is a question at the present writing which mills are the better off, the mills which have no yarn bought on

O. K. SOAP CO.
MANUFACTURERS
FINE TEXTILE SOAPS,
SILKINE,
AND LISLE SILK FINISH
For Fast Black and Colors. Softness and lustre.
Write us to-day.
968 North Franklin Street, - PHILADELPHIA.

LINEN YARN IMPORTER.
HUGHES FAWCETT, 115 Franklin Street, NEW YORK.
Flax, Hemp and Jute Line and Tow Yarns,
For Weaving Purposes.
Linen Jacquard Harness Twines,
Fine Cotton Harness and Heddle Twines,
For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

Mercerized and Plain
Skein, Warps,
Cones, Cops,
Tubes
COTTON YARNS
426 and 428
Market St., Phila.
Theo. H. Strouse & Co.

Ballou Yarn Co.
PROVIDENCE, R. I.
Harness and Seine Twines and other Job
Gassing, Winding, etc. All Numbers.
GASSED YARN SPECIALTIES

American Cotton Yarn Exchange
COMBED and CARDED
COTTON YARNS
From Northern and Southern Mills.
American, Egyptian,
Peruvian and Sea Islands.
ARNOLD B. SANFORD, Pres. and Gen. Mgr.
PERCY H. de MAURIAC, Vice President.
OFFICES: 67 Chauncy St., Boston.
240 Chestnut St., Philadelphia.
108 Franklin St., N. Y. with James Talcott.

F. C. BARTON
MANUFACTURER OF LILY BRAND NARROW FABRICS
RIBBONS, TAPES, BINDINGS & NON ELASTIC WEBBINGS
54 FRANKLIN STREET, NEW YORK

ALLEGHENY WORSTED MILLS,

Thomas Wolstenho'me Sons & Co.,
MANFRS. OF
ALL NUMBERS
SINGLE AND TWO-PLY,
On Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural and Fancy Mixes.

Worsted
YARNS
Sell Direct,
Office and Mills, Frankford Ave. and Westmoreland St., Phila, Pa.

Pocasset Worsted Company,

WORSTED YARNS
IN THE GRAY.

Mills at
Thornton, R. I.

Office
100 Boylston St., Boston, Mass.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—White or colors, in skeins, on spools, cones, or shuttle bobbins.

Novelty Yarns—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making yarns only.

Genapped Yarns of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

DYERS OF YARN AND SLUBBING. BRISTOL, R. I.

French System. Bradford System.

B. F. BOYER CO.,

MANUFACTURERS OF

WORSTED AND WOOLEN YARNS,

Office and Mill, Delaware and Cooper Streets. CAMDEN, N. J.

Woolen and Merino YARNS

Eaton Rapids Woolen Mills,
EATON RAPIDS, MICH.

EDDY & STREET,

Cotton, Woolen,
Yarns and Braids
Worsted, Spun Silk.
PROVIDENCE, R. I.

RICHARD CAMPION,

SELLING AGENT FOR

Bristol Worsted Mills,
Highland Worsted Mills,
Loridan Worsted Co.,

17 Bank St., PHILADELPHIA, PA.

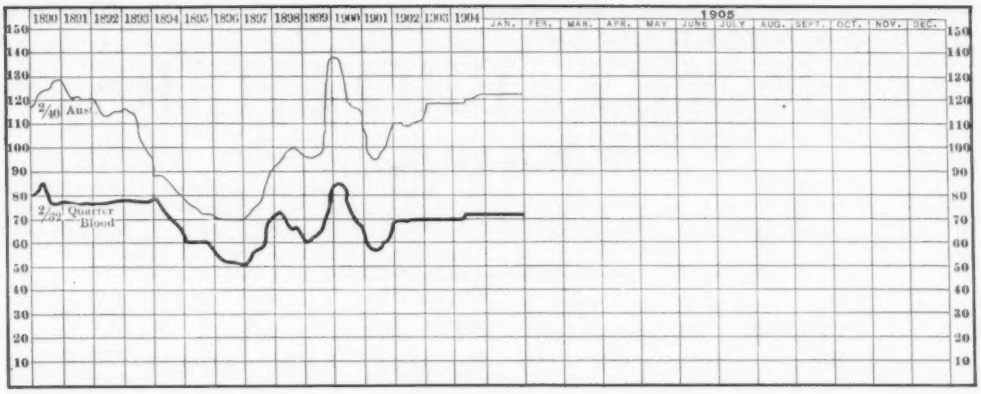


CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

speculation or the mills which have much yarn purchased for which they have no corresponding orders for cloth. Of course those with orders for yarn at a low basis of value will get what orders are placed for cloth because the mills which have no yarn on contract cannot compete, and at the beginning those mills with contracts placed at low prices will have the best of the situation. Later in the season the positions may be reversed.

Some of the weavers state that the cloth buyers of fancy worsteds are ordering 3 1/2 yards of cloth, having this cloth made into sample suits, and intending to sell clothing from them before placing large orders, taking chances on getting the cloth after their actual requirements are known. Some good orders have been secured on cotton worsteds although weavers were forced to lower prices, and many of the mills making this class of goods are well sold up. Buyers, believing that worsted cloth would be beyond them, bought largely of cheap woolens. Now that those who own cheap yarns are making low prices for worsted cloth these buyers are cancelling orders for the cheap woolens, and it is believed they will order largely staple piece dyes and mercerized worsteds in their stead. This cloth has not advanced over 2 1/2 to 3 cents per yard.

There is much complaint from both weavers and spinners. The weavers report that some of the spinners who had accepted yarn orders at a low basis of values have been so slow in making delivery that it was necessary to purchase yarn supplies from other sources, rather than lose business. Some of the spinners with good reputation suddenly were unable to make satisfactory yarn, thus forcing cancelations in that way. On the other hand some spinners had orders at low prices, for deliveries at a certain time. The purchasers who did not order forward deliveries at the times specified, were notified by the spinners that as they

SILK NOILS AND SILK NOIL YARNS
In White and Colors.
A. T. SKERRY & CO., 47 Leonard Street, NEW YORK.
MOHAIR LOOPS, KNOTS AND FANCY YARNS FOR DRESS GOODS & CLOAKINGS.

QUEENSBURY MILLS WORCESTER MASS.
MOHAIR TOPS AND YARNS FOR WEAVING
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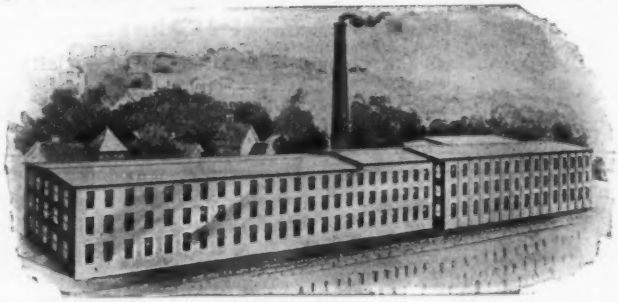
SPINNERS OF MOHAIR YARNS FOR ZIBELINES
DRESS GOODS YARNS
KNITTING YARNS
WORSTED YARNS
MOHAIR

CHENEY BROTHERS,

Silk Manufacturers,

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TRAMS, ORGANZINE AND SPUN SILKS IN THE HANK, OR ON SPOOLS AND CONES.

SILKS FOR ELECTRICAL USES, INSULATION AND SPECIAL PURPOSES MADE TO ORDER.

KNITTING SILKS, RIBBONS AND PIECE GOODS FOR TRIMMING KNIT GOODS.

Pure Dye and Fast Colors Warranted.

WILLIAM RYLE & CO.,

Foreign and Domestic

Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., NEW YORK.

SAUQUOIT SILK MFG. CO.,

INSULATING AND BRAIDING SILKS.

ORGANZINE, TRAM & HOSIERY SILKS.

Fast Dye Organzines for Woolen Manufacturers a Specialty.

Mills: Bethlehem, Pa., Phila., Pa., Scranton, Pa. New York Representatives, Wm. Ryle & Co., 54 Howard St.—Phila. Office, 4015 Clarissa St., Nicetown.—Chicago Office, 210 Monroe St.—Boston Office, 78 Chauncy St.

Crochet Lace Edgings

Spun Silk, Splicing Yarn, Mercerized Yarns, Cotton Warps, Sewing Threads, Tapes, Braids, Domets, Cambrics, Silesias. : : :

Write for Prices and Samples. **George W. Chapin** 229-231 Church St. PHILADELPHIA

had not ordered forward the yarn, they had concluded it was not wanted, and the orders had been canceled. The spinners claim that they could not allow these delinquents to speculate on their capital.

It is claimed that one large concern has been trying to corner the wool and yarn supply, and has engaged much spinning machinery where the prices are reasonably low. The dress goods manufacturers seem to be hit the hardest in the present advance. Prices on 2/36's, 1/4 to 3/8 Blood grade—a size which is largely used by these manufacturers, has advanced from 72 1/2 cents to 92 1/2 cents per pound, an advance of 20 cents per pound in seven months. This necessitates the use of other yarns, and in consequence much woolen yarn will be used in dress goods. Then again this class of trade, in order to make cloth at prices within the reach of the buyers, are planning to use 1/18's instead of 2/36's, sizing the warps. It is the only way out for these manufacturers at present values of yarns.

Hosiery manufacturers generally have booked orders for yarn at low prices, and many of these knitters own yarn cheaper than any other class, yet they can get no orders for hosiery, for much of this hosiery is plated with cotton yarn, and while they own their worsted yarn cheap, most of them own their cotton yarn at very high figures, and hence a positive loss confronts them. To make matters worse, spinners are canceling orders because the knitters are not ordering the yarn forward as agreed. Some of the knitters making fine worsted underwear have not sold more than one-third of their product because of the high prices knitters are forced to ask for garments, and the manufacturers claim they can sell their holdings of yarn and wool at higher prices than they can get for the finished product. The salesmen are unable to make the buyer purchase in the usual amounts.

The combers of tops are very busy and will continue well employed. Prices are well maintained. The general situation is a complex one. The spinners, now that their wools have been covered with prospective orders, cannot sell yarn and buy the wool on the market without an advance in come instances of 20 cents per pound. Yet these same spinners have spinning orders for yarn at prices which are at least 15 cents per pound under prices at which certain classes of yarn are offered. The spinners are expecting most of their new business from the weavers who have purchased only a portion of their supply and who will pay the advance on yarn and keep their whole plant running. Some failures are looked for because of the present condition of affairs in the wool situation. There is some uneasiness on the part of the spinners

DAVENPORT PEARL BUTTON CO.
Davenport, Iowa.
Manufacturers of
PEARL BUTTONS.
New York Office, - - - - - 377 Broadway

JENCKES SPINNING CO.,
Formerly E. JENCKES MFG. CO.
Carded and Combed Cotton Yarns for Weavers and Knitters.
Double and Twist Yarns for Woolen Trade.
PAWTUCKET, R. I.

WILLIAM B. CHARLES,
Cotton Yarns,
Cotton Cloth,
Silesia, Sateens,
For the Underwear Trade.
AMSTERDAM, N. Y.

GRANT YARN CO.,
COMBED AND CARDED COTTON.
YARNS 40's and above. AND
FITCHBURG, MASS. WARPS

FLOSSETTE MILLS
of the
New England Thread Co.
CENTRAL FALLS, - - R. I.
(DYERS and BLEACHERS; and MANUFACTURERS of
High Class Threads on Tubes, Spools and Cones and
MERCERIZED YARNS for Knitting.
GLAZING OF YARNS
For the Shoe Lace. TAPE and WEBBING TRADE.

C. MOORE & CO.,
Manufacturers of
TWINES, THREADS AND YARNS,
Jacquard Harness Twines of all kind
on hand and made to order.
S.W. Cor. Fifth and Market Sts., Phila.

Knitting and Weaving
YARNS.
Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.
EDWARD S. HYDE,
226 CHESTNUT STREET,
Philadelphia, Pa.

Of Two Evils, Choose Neither!

Don't use fluid oils, and oil your belts, your floors and your goods, as well as your bearings.
Don't use greases, which don't feed till the bearings grow warm, and leave a gummy residue behind, causing an increase of 25 or 30 per cent in the friction load.
Use **NON-FLUID OILS**, which don't drip like the corresponding fluid oils, nor inflate your coal bill like greases.
Our booklet tells why. May we not send it to you, with free samples to prove our claims? Better write to-day.

NEW YORK & NEW JERSEY LUBRICANT CO.,
17 Church St., New York City.

JOSEPH M. ADAMS CO.
WOOLEN YARNS,
Carpet Backing and Rug Yarns a Specialty.
ARCOLA MILLS,
Main St., foot of Centre St., Manayunk, Phila.

Woolen and Merino Yarns,
1 to 10 Runs, at reasonable prices.
All Wool, Mohair and Wool Spun or Mixed Cotton and Shoddy Yarns, in white, gray, and colors.
Dress Goods Yarns a Specialty.
E. M. ROCKWELL, - - LEOMINSTER, MASS.

E. C. HARPER,
WORSTED and WOOLEN YARNS,
MERCERIZED COTTON,
395 BROADWAY, TEL. 1926 FRANKLIN NEW YORK.

YARNS Solis, Boston.
77
SUMMER STREET.
ANDREW J. SOLIS, Jr. & CO.

HOFFMAN, DeWITT & McDONOUGH,
Diamond Stay Bindings TRADE MARK
Manufacturers of
Tapes, Webbing and Bindings.
COTTMAN and G STS., PHILADELPHIA
Ryer's Station, P. & R. R. R.
Bell Telephone, 203 Cheltenham.

Wiscasset Mills Co. | Patterson Manfg. Co.
Efrid Manfg. Co. | Tuscorora Cotton Mill.
High Grade Hosiery Yarn
White and Colors. All Numbers.
Sewing Twine on Cones and Tubes.
SPECIALTIES IN WEAVING YARN.
Black and white. Double and twist for woolen trade.
CANNON MILLS, 55 Leonard Street, New York.

that spinning instructions will not be forthcoming promptly. We quote as follows:

2/40's Australian	1.20
2/40's XX Delaine	1.10
2/40's Half Blood	1.05
2/20's Half Blood	.85
2/36's 3/8 Blood	.75
2/26's 1/4 Blood	.68

Woolen Yarn.

Spinners working on commission continue busy with all their machinery space engaged. Many of the contracts were placed early in November. At that time there was much shifting of machinery as the men's wear and overcoating trades were slack and they allowed some machinery space to get away from them which was taken up by other weavers and knitters. At this time manufacturers are trying to secure the machinery given up and find it gone past recall so far as they are concerned. During the coming heavy weight season there will be a great shortage of machinery making woolen yarn.

There will be a good demand for woolen yarn from the weaving trade, as weavers must substitute woolen yarn for worsted yarn in order to get prices within the range of the buyer's ideas, and much woolen warp yarn will be used with worsted filling. We have heard of many large orders being placed for woolen yarn, some weavers buying these yarns outright from spinners. The rubber boot lining trade is calling for much cheap yarn, and some very good 4-run yarn has also been ordered. We also note a good demand for sale yarn from the dress goods manufacturers—yarn made from carbonized stock and also silk noil yarn. The price of worsted yarn having advanced 25 per cent., dress goods weavers are substituting woolen yarn as much as possible.

The knitters of fleece lined underwear are sampling yarn for future deliveries, much of it being merino yarn made with a percentage of Peruvian cotton. In this connection it may be well to state that while Peruvian cotton is selling today at 21 1/2 cents per pound, it is predicted that it will be selling as high as 28 cents per pound inside of 60 days. The reason for this is that a short crop is anticipated, not more than 5,000 or 6,000 bales as compared with the usual crop of 100,000 bales. There is much 2-ply and 3-ply woolen yarn being used by the knitters of sweaters and other articles of this description. The demand will be increased this year because of the high price of worsted yarn. The knitters of Cohoes and in other fine and flat goods centres are busy on wool goods, and when the present stocks of wool are depleted it will be

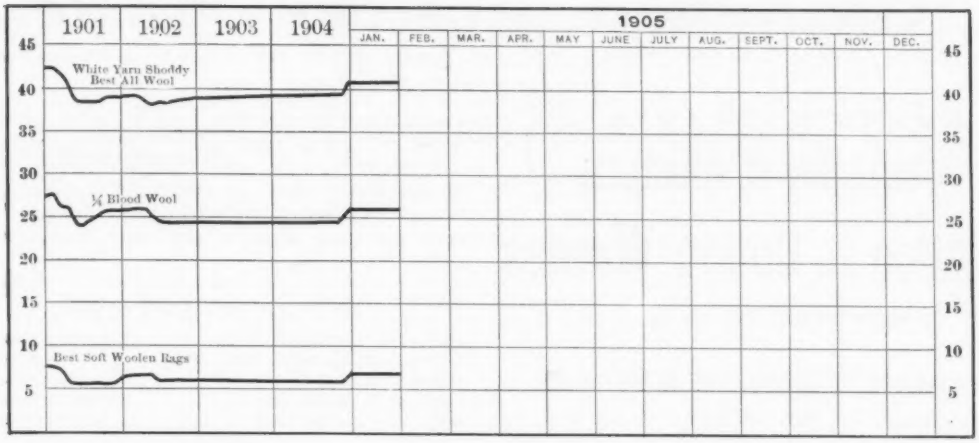

CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

a hard proposition to place suitable garments on the market at the required prices.

The knitters using Australian lamb's wool have not much cause for complaint because while some importers are asking much more for Australian lamb's wool, those who purchased later in the season are selling it at the same price or possibly a cent in advance over last year. We note that there is some short South American lamb's wool which is called Australian lambs, and which is sold under the price of genuine Australian lambs. These South American lambs can be easily discerned. They are shorter than Australian lambs, not so good a color, being of a slightly yellowish tinge, and are apt to have a little kemp through them which does not show prominently until it is spun into yarn and knitted into garments. Australian lamb's wool is being largely bought in France and later a scarcity may be felt here, so that the knitters who buy in February, March or April will do the best as to price.

Government contracts are anticipated within the next 60 to 90 days and from the new standard of specifications requiring the use of natural black tops, much thread waste is being imported and sold at prices ranging from 63 to 65 cents per pound. Knitters are making heavy purchases of this class of stock which will take the place of fine tops. These fine tops are selling from 74 to 77 cents per pound, and the threads at 63 to 65 are giving good results at much less money.

Dry combed noils from the Continent of Europe are being offered and in the spring will be used extensively by the felting trade. These noils are offered at 59 1/2 cents per pound, are of good staple and practically free, and are sold with a conditioning certificate so that instead of a loss a gain will result. Those who have tried these noils find that they are as cheap as the domestic offerings and are certainly much finer. The general outlook for the next three years is good for the spinners; all machinery is employed and the demand for the coming year is such that none will be idle and manufacturers will find it hard later to secure any for over plus work.

Rag and Shoddy Market.

Collections of rags have been slow and this has enabled holders to maintain prices in spite of a tendency toward lower quotations. It is said that the continued holding off by buyers has brought several rag dealers to the point of making concessions in order to move their stocks. This, however, has not been a general feature of the situation, and, as a rule, buyers have found holders unwilling to shade prices.

Desirable lots are rather scarce and there have been many complaints regarding the lowering of the quality. This is an indication that stocks are small, which, coupled with the small supply, leaves the rag market in a strong position.

A large quantity of rags is going into consumption, and shoddy manufacturers have paid prices that they considered excessive in order to complete contracts for stock. Spinners are using a larger amount of shoddy than usual, owing to the high cost of wool. The strong statistical position of wool makes it probable that the market for wool substitutes will continue strong. Consumers of shoddy are limiting their purchases to actual requirements, owing to the high prices, but this does not prevent the buying of more stock than for many years past.

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In Cotton, Cotton and Wool Mixes, and All Wool. White and Light Colors a Specialty.

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WILLIAM B. CHARLES,

Cotton and Cotton Wastes

Amsterdam, N. Y., U. S. A.

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Contracts made with Cotton and Woolen Mills for Yearly Waste Production. Correspondence solicited. Shepperson's Code, 1878. Cable Address "Charles."

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WM. H. H. SLACK & BRO.,
Springfield, Vt.

Carbonized Stock a Specialty. **FLOCKS**

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ED. GLUECK, Sec. and Gen. Mgr.

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Cotton Yarns a Specialty.

Wool waste is in good request, with a scarcity of desirable grades. Prices are firmly maintained and dealers find it difficult to buy because the mills are using up their own waste to a greater extent than formerly.

SHODDIES AND EXTRACTS.

White yarn, best all wool	38-40
White knit, all wool, best, fine	28-32
White knit, No. 2	23-25
Light yarn, extra fine	25-28
New pure indigo blue	23-25
Merino.	
Fine light, all wool, No. 1	24-25
Medium light, all wool, No. 1	16½-17½
Medium light, all wool, No. 2	14-16
Fine black, all wool	20-22
Fine dark, all wool, best grade	20-21
Medium dark, all wool, No. 1	13-15
Medium dark, all wool, No. 2	12-13
Red knit stock, strictly all wool	19-20
Red flannel, all wool	19-20
Dark blue for hosiery, strictly all wool, No. 1	17-20
Dark blue for hosiery, not all wool, No. 2	12-14

DELAINE EXTRACTS.

Light	19-22
Medium light	15-17

WOOLEN RAGS.

Regular gray	12-13
Black	14-15
Fancy colors	16-20
Fine merchant tailors, all colors	9-11
Choice light colors	13-15
Browns	12-13
Blacks	9½-10½
Fine blues, plain	9-11
Fine dark	10-11
Medium dark	7-8
Worsteds.	
Blue	16-18
Black	18-20
Serges.	
New black	15-16
New blue	14-15
Flannels.	
New scarlet	18½-22
New blue	17-18
Cloakings	3-4

SOFTS AND KNIT STOCK.

Soft woolens, best	7-7½
Old white flannels	14-16
White flannels, No. 2	11-12
Old red flannels	9½-10
Light blue flannels	7½-9
Old blue flannels	6-7
Fine worsted, new black	26
New blue clip, best, fine	20-22
Dark mixed yarn, extra fine	22-24

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Specialist in the Manufacture of

Spirals and Ledger Blades for Shearing Machines

of all kinds. The oldest Cloth Shearing Knife Mfr. in Germany.
American Agents Wanted.

All wool yarn, medium and coarse grades	15-20
Old plaids	5-7
White stockings	17-18
White hood stock	20-21
Clear hoods	9-10
Red stockings	9-10
Blue stockings	7-8
Fancy stockings, No. 1	7-9
Gray stockings	9-10
Black stockings	9-10
Knit stock comforters	6-7½
Red knit	9-10
Light gray knit	9-10
New light fancies	16-18
New fancies	12-14
Merinos.	
Light, fine	13½-15
Light, coarse	7½-8
Fine, dark	12-13
Dark, No. 2	8-9
Coarse dark	5-6
Blue	12-13
Blue-seamed	13-14
Black—unseamed	12-13
New black	18-20
Small	3¼-4
Bunting	6-8
FLOCKS.	
Shear, fine white, all wool	9-11
Fine indigo blue, all wool	9-9½
Fine black, and blue, all wool	7-8
Fine dark, all wool	5-6
Gig, fine, all wool	3-4
No. 1, black, all wool cut	6-7
All wool, fancy, shear and gig	2½-3½
NOILS.	
Australian	48-50
Fine domestic	38-40
½ Blood	24-28
⅜ Blood	22-23
¼ Blood	17-19
Braid	21-22
Carpet (white)	14-18
Carpet (colored)	10-12½
Seedy.	
½ Blood	35-37
⅜ Blood	27-30
¼ Blood	23-26
COTTON WASTE.	
No. 1 Spinners	6¼-7
No. 1 Machine	6-6½
No. 2 Machine	4½-5¼
Machine Cop	6½-7
No. 1 Cop	6½-7
No. 1 Card	6¼-6¾
No. 2 Card	6-6¼
No. 1 Oily Card	4-4½
No. 2 Oily Card	3-3½
Peeler Combing	7-7¼
Egyptian Combing	Limited Quantity
No. 1 Linters	4-4½
No. 2 Linters	3½-4
White Clips	6-6½
Colored Clips	4½-5
No. 1 Picker	2-3

Dyestuffs and Chemicals.

Acids.

Acetic 100 lbs.	2.25-3.70
Citric, domestic	32-32½
Oxalic	5-5¼
Sulphuric, 60 deg. 100 lbs.	1.10-1.30
Muriatic, 18 deg.	1.50-1.60
Tartaric crystals	30½-30¾

Miscellaneous Chemicals.

Acetate of lime, gray 100 lbs.	2.00-2.05
Alum, lump	1.75-1.80
ground	1.85-1.95
powdered	3.00-3.25
Aqua ammonia 16 deg.	3¾-4
Ammoniac, sal. gray	5¾-6
Borax, bbls.	7¾-8
Brimstone, crude, foreign ton	21¼-21½
Copperas	52½-65
Cream tartar, crystals	24½-24¾
Fuller's earth, lump, 100 lbs.	80-85
powdered	80-85
Glauber's salt	50-60
Potash, chlorate, crystals	8¼-8¾
powdered	8⅜-9
carbonate	3.6-5
Soda ash, carbonate, 48 per cent.	1.25-1.50
high test	1.00-1.25
Soda, bicarbonate, English	3.50-6.00
American	1.30-1.70
Soda, caustic, domestic 60 per cent.	1.85-1.90
Sal. English	67½-70
Sal. American	60-70
Sulphate, alumina	¾-1¼
Vitriol, blue	5.15-5½

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Any careful man can apply it.

Sufficient for 40 sq. ft., $5; 125 sq. ft., $12.
If your supply house does not sell it, order direct.

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Woolen Mills

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AT

TRENTON, New Jersey,

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Large Mill, 230x58, four and five stories.

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Steam and Water Power, improved machinery and ten sets of cards.

The Machinery will be offered in parcels, separate from the lands and buildings, and the property will be sold as an entirety or in parcels, whichever method will realize the greater price.

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Special Master, &c.,

TRENTON, - - - - NEW JERSEY

Dyestuffs.

Acetate of soda	3½-3¾
Acid, picric, best crystals	25-30
tannic, commercial	33-35
Albumen, egg	48-65
blood	20-26
Alizarine, red	15½-16
Aniline oil	9¾-10
salt crystals	8¾-9
Antimony salt, 65 per cent	10¼-11
Bichloride of tin, 50 per cent	9¼-9¾
60 per cent.	12½-12¾
Bichromate of potash, American	8½-8¾
Bichromate of soda	6½-6¾
Bisulphate of soda	1½-2
Cutch, mat	4½-6
boxes	5-8
Dextrine, imported	6¾-7½
corn	2½-3
Divi-divi ton	35.00-40.00
Flavine	23-40
Fustic, stick, ton	22.00
young root	31.00-35.00
Gambier	4⅝-4¾
Hypo. of soda, Am. bbls. cwt.	1.50-1.60
Indigo, Bengal, low grade	60-67½
medium	70-80
high grade	95-1.00
Kurpah's, medium to good	55-60
higher grade	65-75
Gautemala	55-75
Manila	48-55
Madras	46-50
J. (Synthetic)	18-20
Indigotine	95-1.80
Logwood, stick, ton	16.00-23.00
roots	16.00-18.00
Madder, Dutch	7-10
Muriate of tin, 36 degrees	9-9¼
52 degrees	15-15¼
Nitrate of iron, commercial	1¼-1½
Nutgalls, blue Aleppo	30
Persian berries	6-7
Phosphate of soda	2¼-3
Prussiate of potash, yellow	13¾-14
Quercitron, ton	18-20
Starch, corn, pearl, bbls.	2.20
corn, pearl, bags	2.05
potato	3¾-4½
rice	6½-7½
wheat	5¼-6
Stannate of soda	12-20
Sumac, Sicily, No. 1, ton	43.00-46.00
Sicily, No. 2, ton	41.00-43.00
Virginia	37.00-38.00
Tapioca flour	1.95-2¼
Tin crystals	22-23½
Turmeric, Bengal	3-3¼
Zinc dust	5¼-5½

Extracts.

Fustic, solid	8-11
liquid, 51 degrees	6¼-8
Indigo	6-10
Logwood, solid	6-12
liquid, 51 degrees	5-10
Persian berry	9-15
Sumac	3-6

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MERCERIZED YARNS

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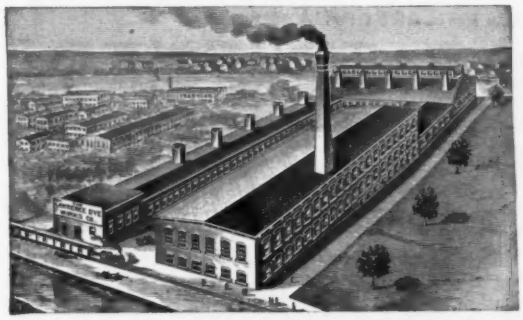

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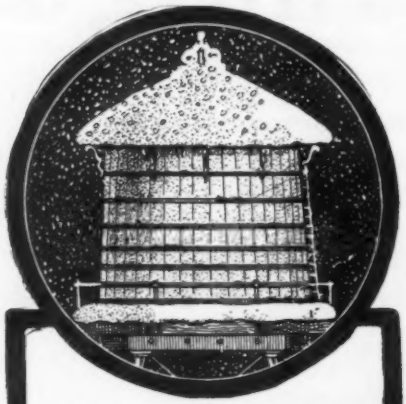

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Dyes Raw Stock or Yarn in Cops, Skeins or Bundles (Warps)

DYES SULPHUR COLORS without bronzing or streaking and leaves the stock in perfect condition for carding or weaving.

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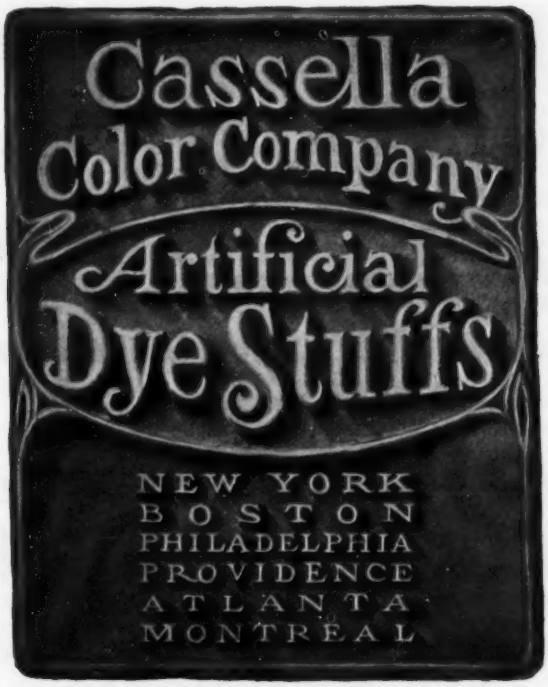
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Sulphide of Sodium

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All Soaps Guaranteed Pure and Unadulterated.

A trial order has very often secured for us desirable trade

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of every shade and description, absolutely fast to sunlight, fulling, acids, etc.

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dyeing either after the one bath method absolutely fast, or on chrome bottom.

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Established 1863.

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A NEW DIRECT DYEING
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Fast to Light, Air, Alkali, Acid and Strong Soaping. Requiring
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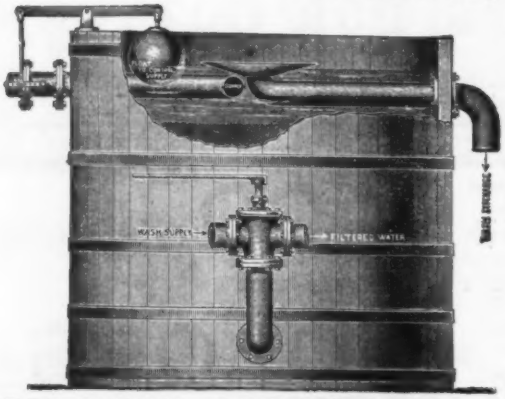

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Our filters are already in use in a number of the representative textile mills of the country, from whom we have received many expressions of satisfaction. Our representative will call and explain our system whenever desired.

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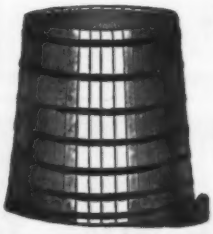

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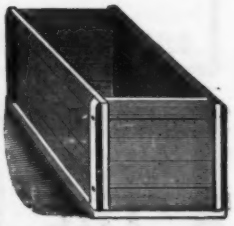
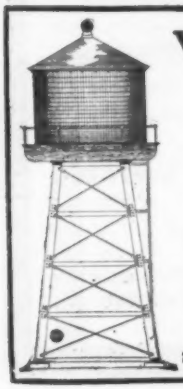


Office, Land Title Building, Broad and Chestnut, Phila., Pa.



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DYE TUBS, VATS AND TANKS FOR EVERY PURPOSE.
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LOGWOOD EXTRACTS
HEMATINE, JAMAICA, B. W. I.
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Aniline Colors and Dye Extracts.

New Vilal Black Extra
An Improved Sulphur Black.
THE LATEST NOVELTIES IN FAST GREENS
(Equal to Sumac)

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Sizing, Stiffening, Softening and Finishing Compounds, Glues, Gums, Dextrines, Starches, China Clay, Bone Size and Grease, Soap, Tallow, Weighteners,
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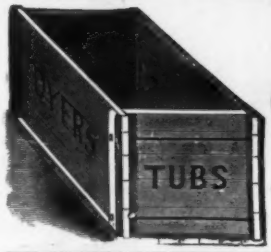

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Manufacturers of
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Tubs and Tanks of all kinds for Dyers, Bleachers, Factories, etc.
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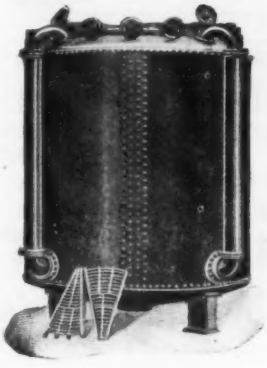

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BOILERS, TANKS, PLATE WORK
Special Attention
Given to Repairs
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(Formerly McMichael & Wildman Mfg. Co.)

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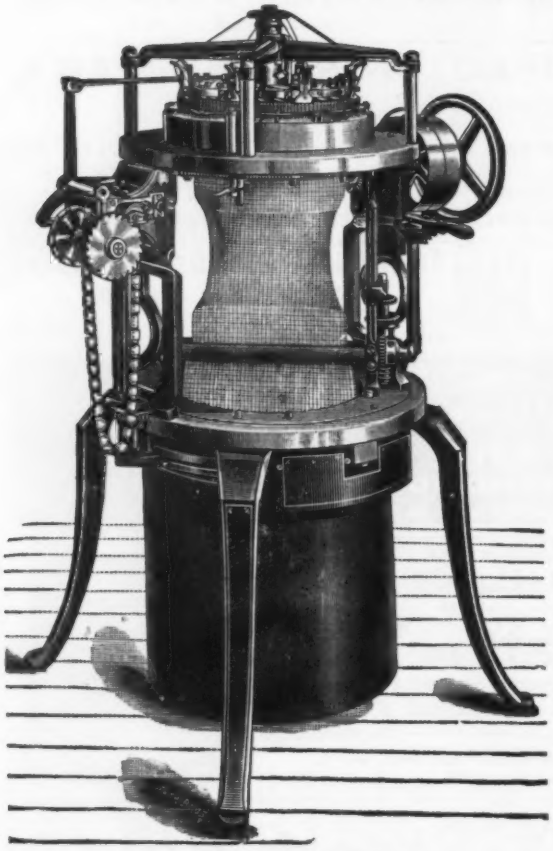
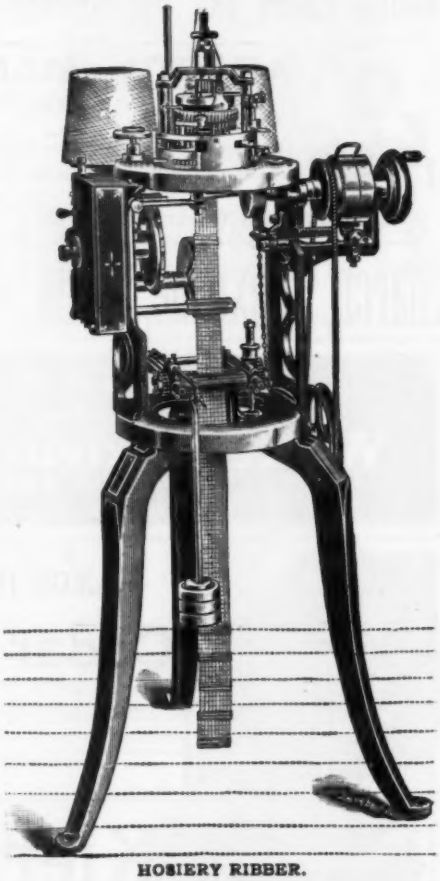
AUTOMATIC AND PLAIN

For all classes of Ribbed Hosiery and Underwear, Combination Suits, Sweaters, etc.



AUTOMATIC BODY MACHINE.



HOSIERY RIBBER.

ESTABLISHED REPUTATION FOR LARGEST PRODUCTION, BEST QUALITY FABRIC, DURABILITY, ECONOMY OF OPERATION

Full Particulars, Description and Samples Furnished upon Application to the

WILDMAN MFG. CO.

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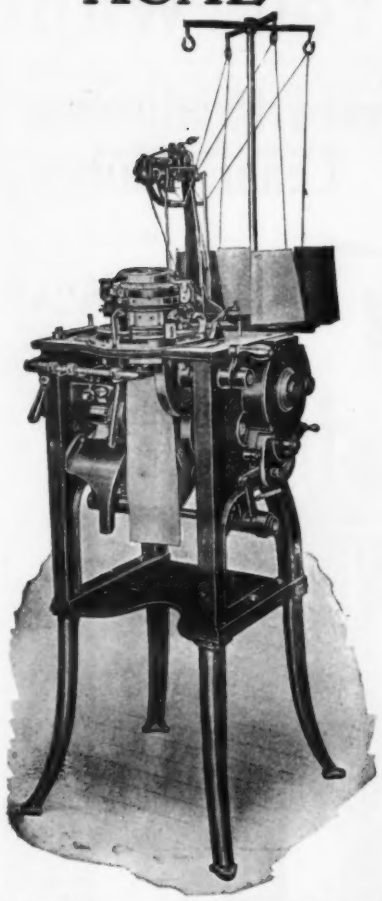

The Two Leaders

Fully Automatic Hosiery Knitters

For Making all Kinds and Gauges of Seamless Hosiery

HEMPHILL

One with

GEARS

the other with

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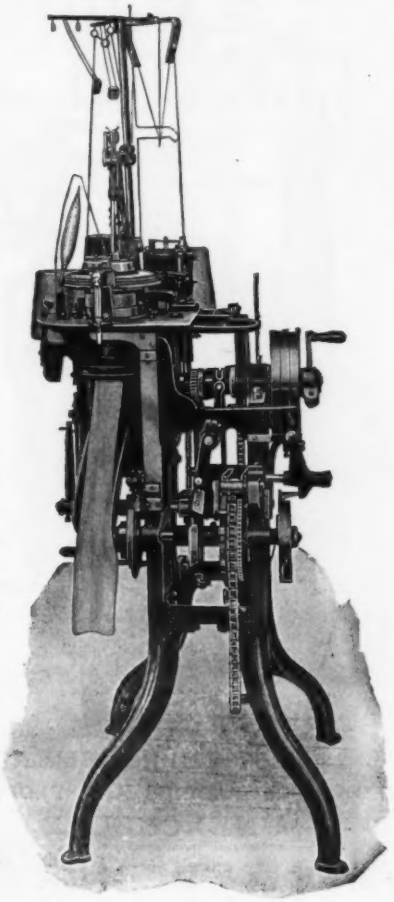
for pattern mechanism



To meet the various tastes of different manufacturers. Both used and approved by leading hosiery manufacturers.

Both contain all the well-known essentials demanded of first-class knitting machines.

With these two machines we can supply all the manufacturer's possible wants in the best possible manner.

Write us for further particulars and prices.

We also make all kinds of LATCH NEEDLES.

Many leading manufacturers use our needles and say they are the best on the market.

Send us a trial order.

E. A. Newton, 245 Race Street, Philadelphia, Pa., agent for the "Hemphill."

This machine can be seen in operation at his office.

Mayo Knitting Machine & Needle Co., Franklin Falls, N. H.

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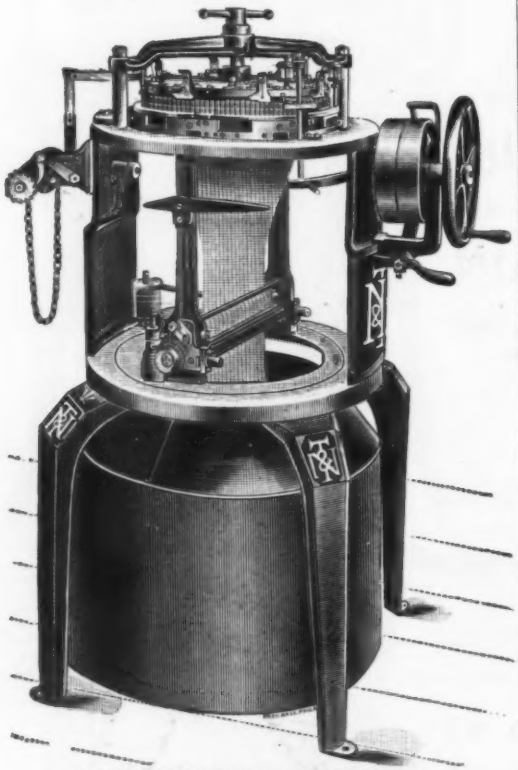
NYE & TREDICK CO.

Circular Rib Knitting MACHINERY

For making Ribbed Underwear, Combination Suits, Sweaters, Cuffs, Shirt Borders, Hosiery, etc. : ; :

Correct Construction. Excellence and Durability.



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QUALITY OF FABRICS AND PRODUCTION
UNEXCELLED

NYE & TREDICK CO.
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If You Want

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Write

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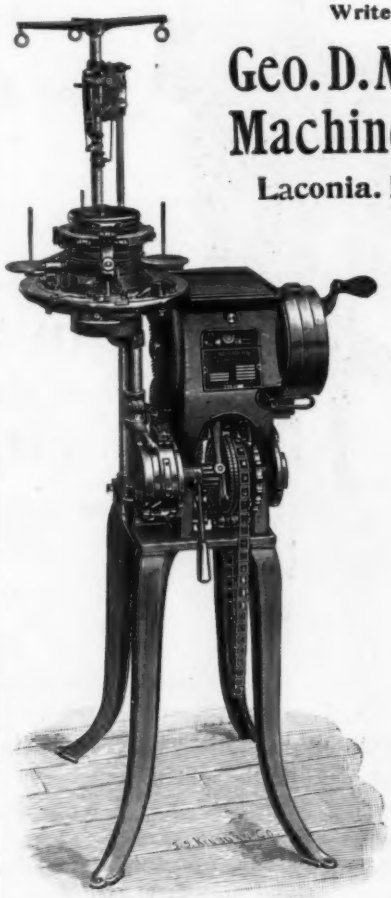

Latest, Simplest, Best.

MAYO'S

New Full Automatic Knitter.

The Old Reliable

Friedberger Mfg. Co.

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EDGINGS AND BRAIDS.

Unequalled Facilities for Prompt Deliveries of Any Quantity.

MILLS at GERMANTOWN, PHILA.

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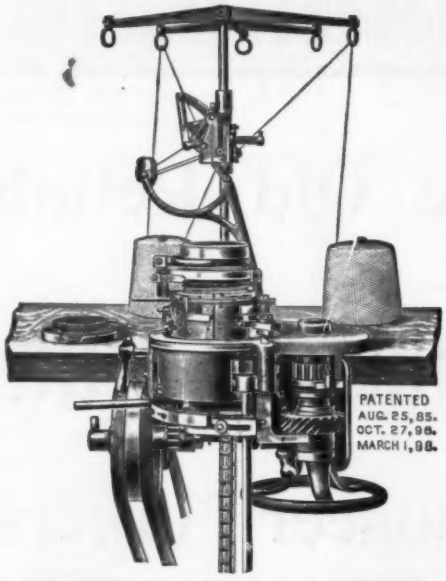
The "INVINCIBLE"

The "INVINCIBLE" is reasonable in price.

It's best advertisement—the recommendation of its users.

Its METHOD of TRANSFERRING is still the best.

Others try to imitate.



Full Automatic Knitting Machine

"The Knitter That Knits."

Leads Them All.

Write for Catalogue.

Philadelphia Office, ROOM 870 BOURSE.

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The Merrow

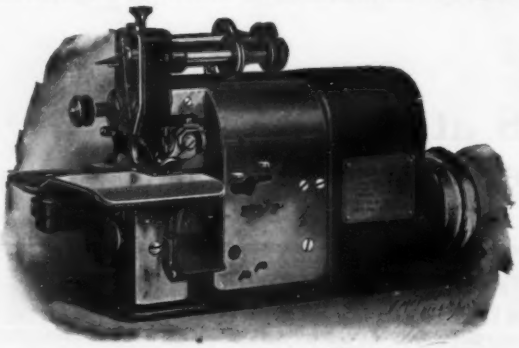
High Speed Overseaming, Overedging and Scallop Stitch Machines

are LIGHT RUNNING, FAST and DURABLE.

OUR NEW STYLE 60 MACHINE for Trimming and Overseaming in one Operation produces the strongest, best Seam and does it with the greatest economy.

STYLE 35 B SHELL MACHINE

For Necks and Fronts of Rib Goods, produces the most showy, substantial finish.



USE STYLE 17 or 22 for Bed Blankets and STYLE 18 for Horse Blankets.

Send for Catalogue and Samples.

THE MERROW MACHINE CO.

Bourse Building, Phila. HARTFORD, CONN. 346 Broadway, New York

CRANE MFG. CO.

SUCCESSORS TO

PEPPER MACHINE WORKS

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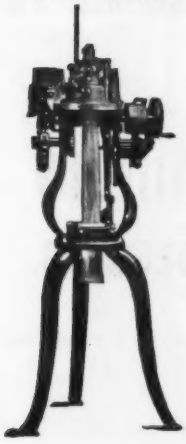
Manufacturers of



Knitting Machinery,

INCLUDING

Pepper's Flat Ribbed Cuff Machines,

Automatic Welt and Loose Course Machines for Stock Tops. New Circular Stripers with Welt, Loose Course and Striping (Automatic), for Short Cuffs, Sock Tops, Hose Legs, Wristers, etc.

Golf and Bicycle Stocking Machines,

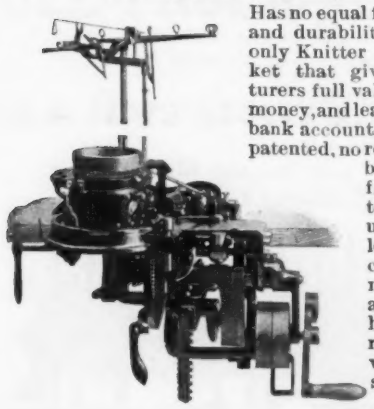
ALL KINDS OF

CIRCULAR RIBBED MACHINES

For Men's Underwear, Ladies' and Misses' Hose Legs and Leggins. Correspondence Solicited.

The New Improved

Boss 15/16 Automatic KNITTER



Has no equal for simplicity and durability. It is the only Knitter on the market that gives manufacturers full value for their money, and leaves a swelled bank account. It is fully patented, no royalty to pay; built in sizes from 2½" up to 6"; from 42 up to 220 needles in 3¾" machine. Knits men's, ladies' and children's hose, plain or ribbed. Runs with one single belt. Automatic tension in heel and toe. Send for prices and particulars to

THE BOSS KNITTING MACHINE WORKS,

Cor. Elm and Reed Sts., Reading, Pa.

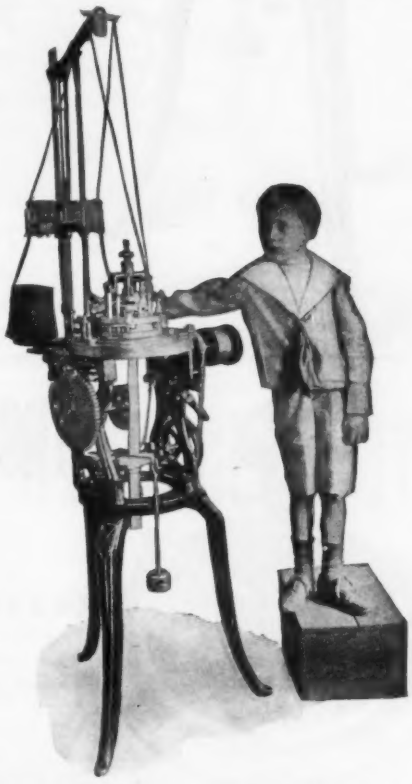
HARDENED STEEL CYLINDERS A SPECIALTY.

A FAIR PROPOSITION

If wanting to purchase Ribbers, you can try a

RUTH RIBBER and STOP MOTION

before buying to satisfy yourself that they are all right. Our STOP MOTION is a decided improvement over all others. No cutting of yarn, easy to thread. Stops from any imperfection in yarn. The movement of one lever releases brake and corrects yarn guide, when stop is caused by knot you have but one hook to thread. Very positive in its action.

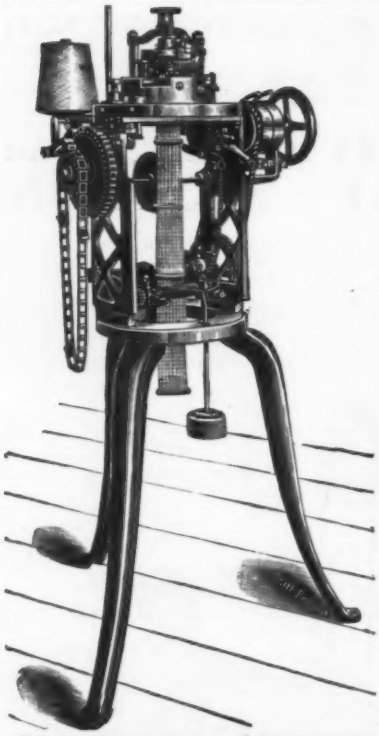


Our RIBBER is high speed, durable, simple and easy to operate, with largest production; single or double feed, plain or fancy stitch for half hose and misses goods. Large loose-course, good round welt, double knee, sleeves or cuffs. Knits wool or cotton yarn, fine or course guage. Hardened cylinders and dials for any make of machine. Best Workmanship. All products guaranteed. Can attach STOP MOTION to any style machine.

Write to-day for price lists.

RUTH MACHINE CO., York, Pa.

Address Box "N." G. W. Ruth, Manager.



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213-215 Race Street, Philadelphia, Pa.

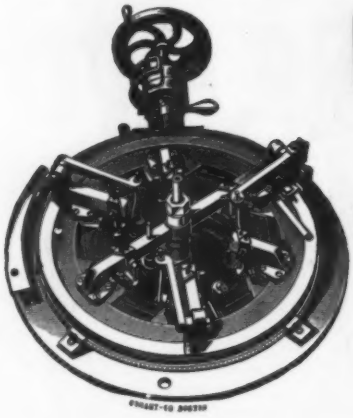
BUILDERS OF

Knitting Machinery

For HOSIERY and UNDERWEAR.

Complete Estimates Furnished. Send for Particulars.

The cut shows our **Improved Automatic Ribber** with Welt and Slack Course for Half Hose, Tops and Ribbed Legs.

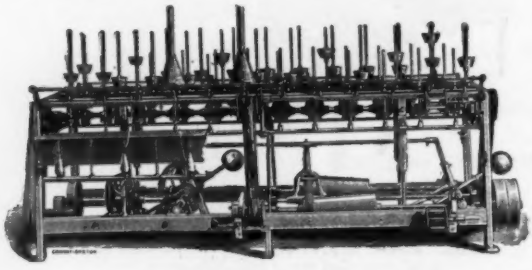


CIRCULAR KNITTING MACHINES

Either plain or full automatic, with stop motions complete. 4 to 24 feeds for

RIBBED UNDERWEAR

Automatic Racking and Striping Machines for Sweaters, Cardigans, Collarettes, Cuffs and Anklets.

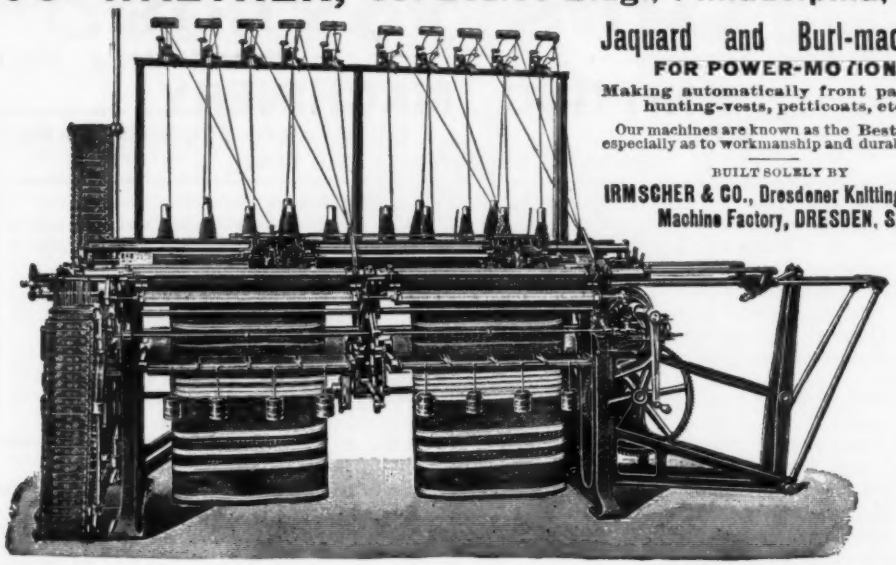


ALSO BUILDERS OF THE WELL-KNOWN

ABEL WINDERS, SEAMERS and LOOPERS.

LEIGHTON MACHINE CO., - Manchester, N. H.

OTTO WALTHER, 591 Bourse Bldg., Philadelphia, Pa.



Jaquard and Burl-machine
FOR POWER-MOTION
Making automatically front parts of hunting-vests, petticoats, etc.

Our machines are known as the Best Built especially as to workmanship and durability.

BUILT SOLELY BY
IRMSCHER & CO., Dresdener Knitting Machine Factory, DRESDEN, SAXONY

SWEATERS.—This machine is built with 1 or two sections which work together (dependently of each-other) and produces all patterns which could be made hitherto on Hand-Jaquard- and Burl-machines automatically in endless pieces with dividing thread. We are ready to wait on with collection of same which will be the best recommendation, and here we will mention but to following advantage of this machine which is constructed very genlously: It is provided with autom. racking-apparatus as far as 6 needles, special cams for double rib, autom. change of all middle and wing-cams, 2 thread-carriers, autom. change of colors, special attachment for locking in the loops and electric stop-motion in case of yarn-breaking, knots, etc.

All these apparatus are set to work by the pattern-chain, consisting of a number of Jaquard-cards. This new arrangement which is our invention enables the knitter to put together any pattern, making the necessary cards by means of a stamp and after a table we subjoin.

Special Hand and Power Machinery for Fancy Gloves, Sweaters, Golf Hose, Ladies' Blouses, Etc.

FULL-FASHIONED HOSIERY MACHINERY

.. BUILT BY ..

Chemnitzer Wirkwaaren-Maschinenfabrik

(Formerly SCHUBERT & SALZER)

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HALF-HOSE LEGGER OF 24 SECTIONS.

All classes of flat work machines for full-fashioned hosiery in all gauges, from 21, 24, 27 up to 51 guage, from 12-24 sections, also machines for full-fashioned shirts and pants in all guages from 6-10 sections, with narrowing and widening.

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KNITTING MACHINERY

OF ALL KINDS. NEW AND SECOND HAND.

A RARE OPPORTUNITY TO BUY.

1 Complete plant; 500 per day of ladies', gents' and misses' hose. Modern mchy.
28 Beattie & Hepworth & Abel loopers.
4 Corneley embroidery machines.
10 Hosiery presses (lever).
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11 Lamb and Grosser sweater machines.
150 Ribbed underwear machines, various sizes and makes. 1 Sensitive drill.
60 Brinton & Co. ¾ aut. knitters, sizes.
27 Standard A machines.
56 Union Special machines, various styles.
1 Rotary fire pump.
1 5 h. p. electric motor, new.
100 Mayo machines. Various sizes.
100 Brooks welters.
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98 Brinton & Co. and other make hosiery ribbers.
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1 36-inch engine driven extractor
1 9 plate Crawford press, 32 x 50.
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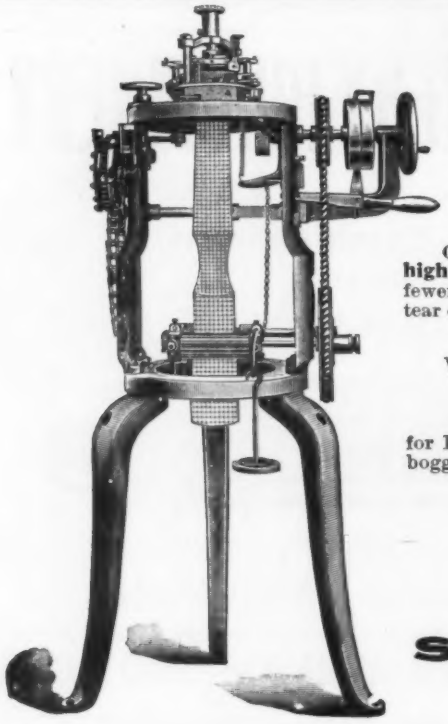
3 No. 50 Merrow machines. C. & G.
1 Grosser Jacquard machine.
3 Cyclone dryers. 2 Typewriters.
5 Band folding and cutting machines.
1 48 spindle Payne Cop winder.
1 Weyburn fabric cutter.
4 30-inch ventilating fans.

WRITE FOR COMPLETE LIST.

APPRAISEMENTS A SPECIALTY.

We are always in the market to buy good second-hand Knitting and Finishing Machinery.



High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at **very high speed,** giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

STRIPING AND DESIGNING MACHINES

for Fancy Golf Stockings, Bathing Suits, Sweaters, Toques, Toboggan Caps, Skirts, etc.

Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.

STAFFORD & HOLT,

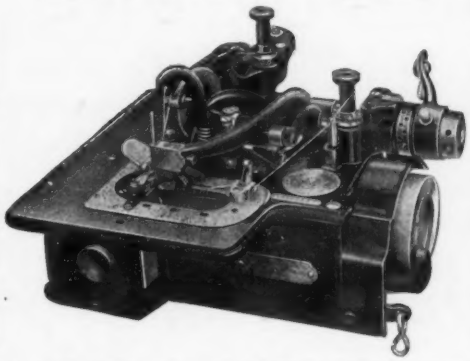
LITTLE FALLS, N. Y.

"OVERLOCK" Machine

TRADE MARK. (Pat. April 5, 1892.)

Patent twice upheld by U. S. Court of Appeals.

For Trimming, Seaming (or Hemming or Overedging) and Covering Raw Edges of Knit Underwear and Hosiery in **ONE OPERATION,** and for making "Overlock" Corded Edge on Lace Curtains, Silks, Ribbons Etc.



Extract from Report of U. S. Consul at Nottingham, Eng.

"The Overlock stitching device of Willcox & Gibbs has had a phenomenal success since the date of its introduction * * * * The keen competition among manufacturers has necessitated its use, both as a matter of economy and to improve the character of output for a discriminating market."

TRADE MARK.

Business Est. 1859.

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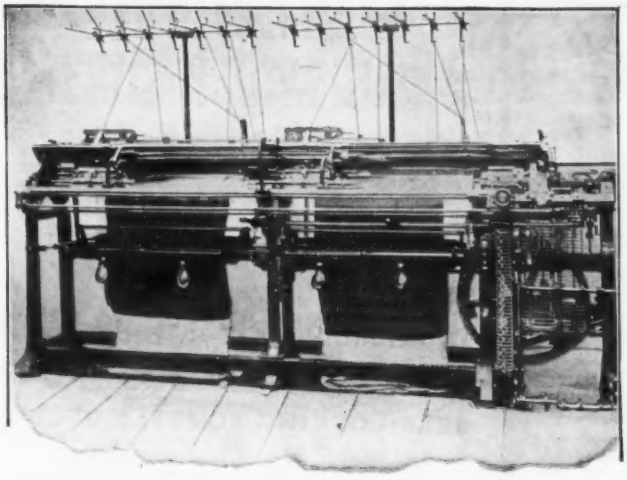
The Grosser Knitting Machine Co.

MAX NYDEGGER,

Wool Exchange Building, Room 400, **260 W. Broadway, NEW YORK.**



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Large Stock in Hand Power Machines, Needles, Parts and Supplies.

Prompt attention.

Best Construction; Selected Materials; Rapid Delivery.

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Full Automatic Knitters

WITH OR WITHOUT

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ALL SIZES AND GAUGES, 2 1-4 INCH TO 4 INCH

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They want to get in touch with a brainy, experienced operator, who can subscribe some stock and assume active management of the plant.

The immediate section produces cotton of the finest staple; the farmers themselves have subscribed stock and are interested in the success of the venture.

Cheap fuel, intelligent white labor, low rates on the finished product, are some of the attractive features.

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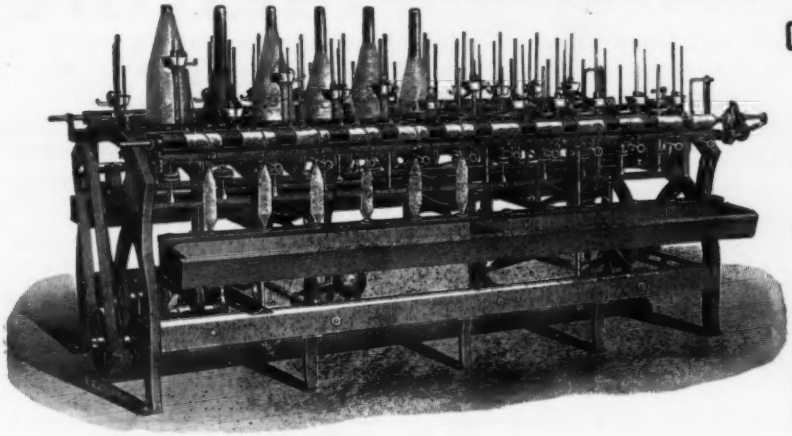
For Hosiery Mfrs., Wind for Cop, Skein or Bobbin.



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To Spool from Cop, Skein or Bobbin.

Doubling Spoolers, for doubling 2, 3, or more ends into one,

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An Electric Stop Motion

Adaptable to all classes of

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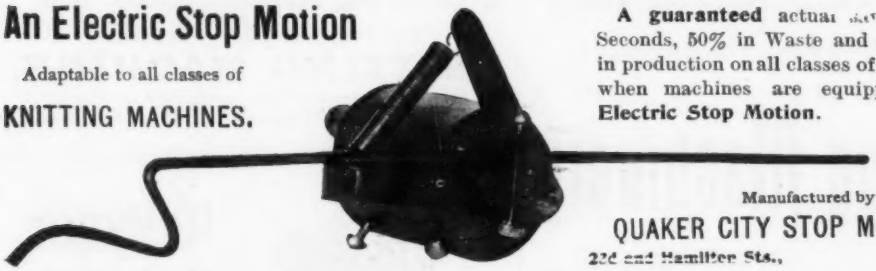

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Manufactured by

QUAKER CITY STOP MOTION CO.,

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AMERICAN DIRECTORY OF THE KNITTING TRADE

FOR 1905

is now in preparation (23rd year of publication), and will be published in March.

Knit goods manufacturers, selling agents, jobbers, etc., who have not yet been personally visited are earnestly requested to send in their reports at an early date on the blanks provided for that purpose. An accurate report *costs nothing*, and saves much annoyance to both the manufacturer and the publishers.

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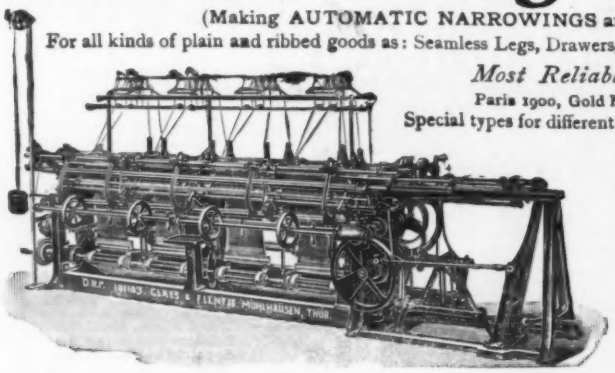

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With Independent Heads, Latest Improvements. Recognized as "The Best."

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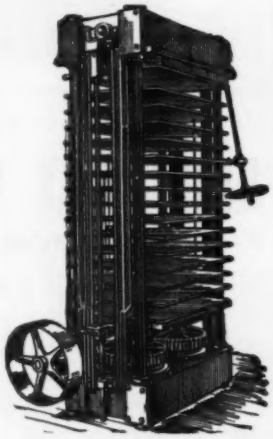
A Specialty of Hardened Bladed Burr Wheels with Self-Oiling Brackets.



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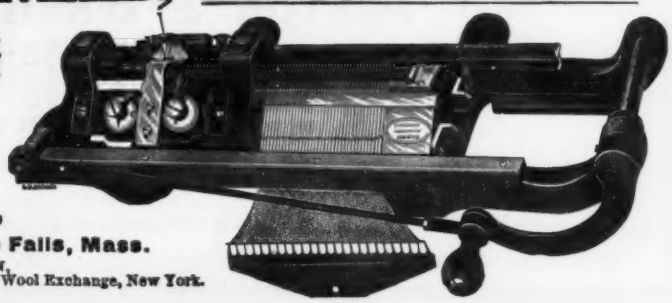

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When you buy a Duck Mill Basket don't buy wooden frames, wooden bottoms and wooden runners—might as well buy the old wooden or splint basket.

Buy a basket that is constructed entirely of steel and duck

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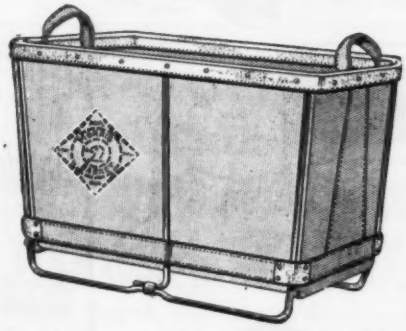

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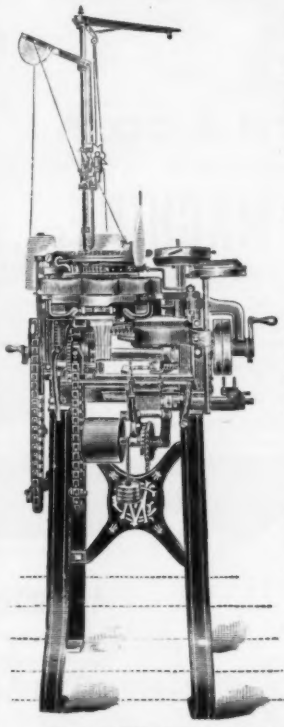

in use than any other make.

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It will produce from **30%** to **50%** more goods than any other machine on the market.

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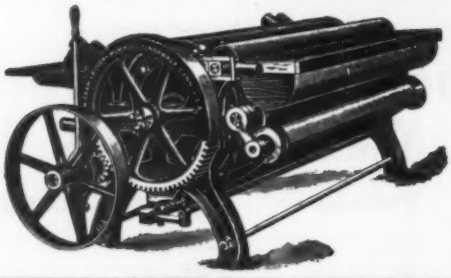

This machine irons and presses ribbed and flat underwear, giving a fine, smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

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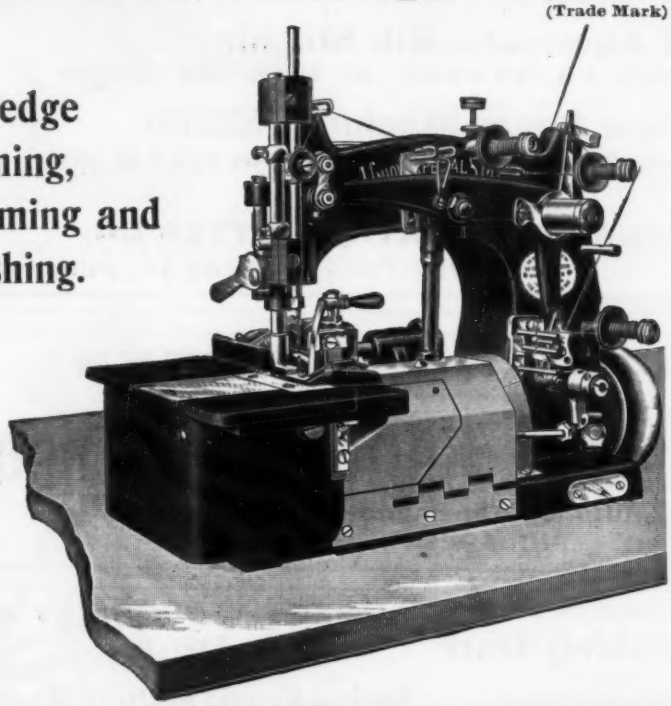

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Simplicity.

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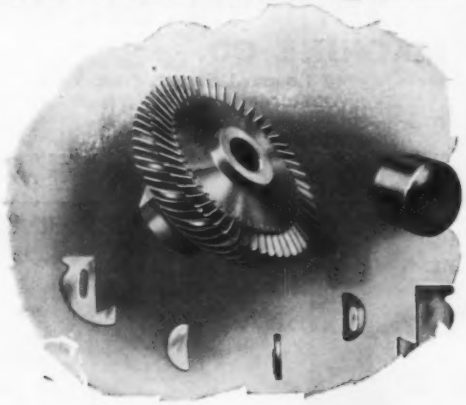

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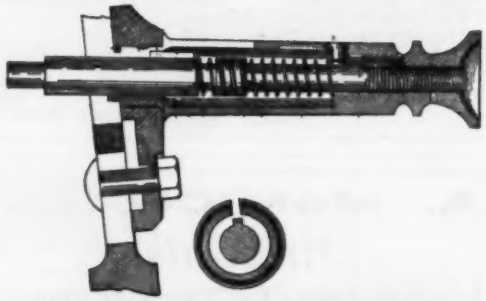

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For every three employed. In other words, the

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IMPROVED CONSTRUCTION
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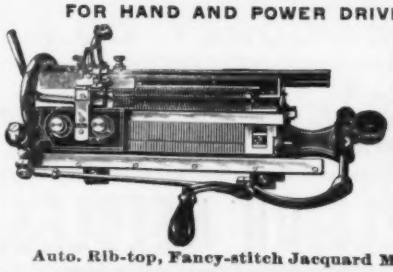

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Everywhere in work. **80,000** Machines sold.

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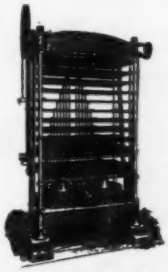

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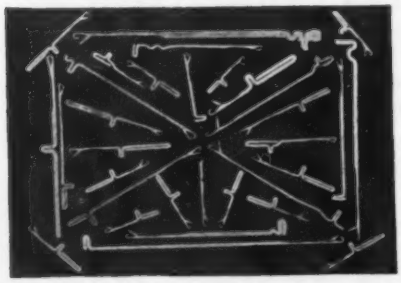

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We also make a Slitter
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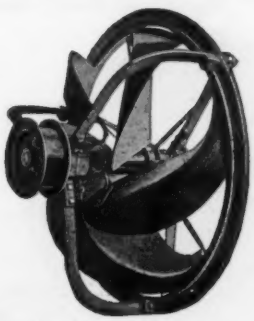

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As used in Connection with Pneumatic Conveyor System for Handling Wool, Cotton, Rags, Excelsior, Jute, etc.

Inlet Side of Right-hand Wool Exhauster. **Pulley Side of Left-hand Wool Exhauster.**

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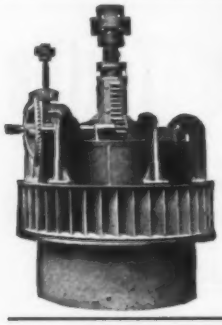

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On Horizontal or Vertical Shafts.

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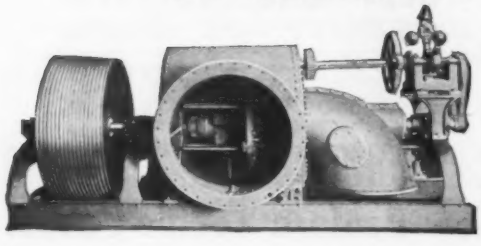

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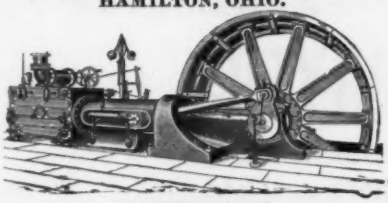

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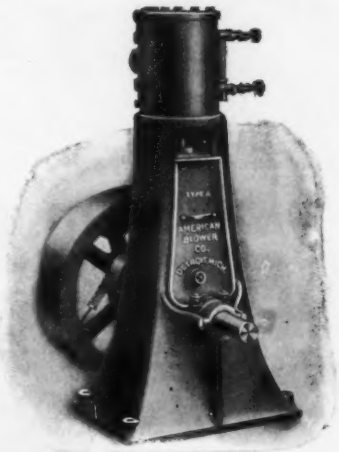

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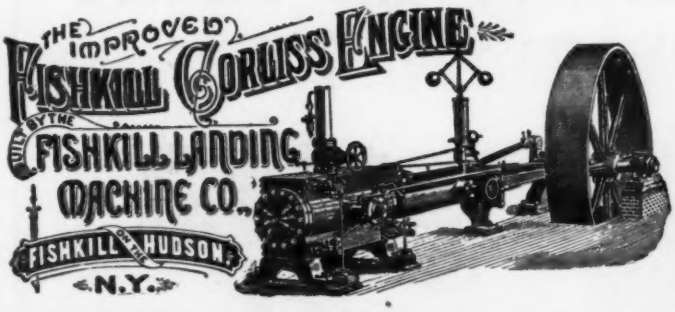

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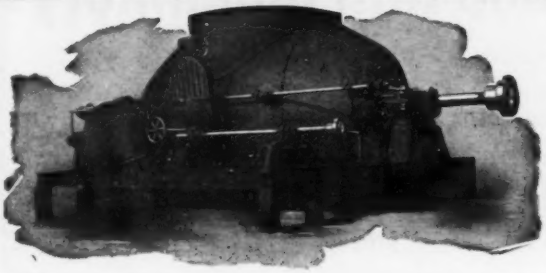

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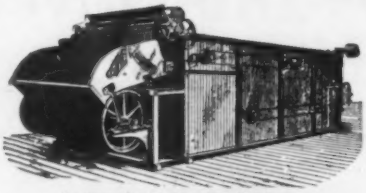

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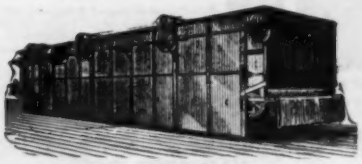

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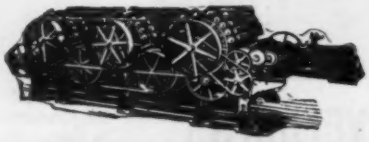

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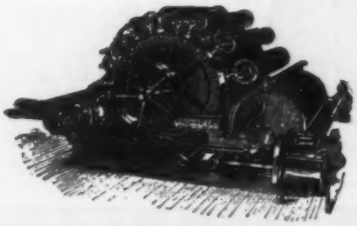

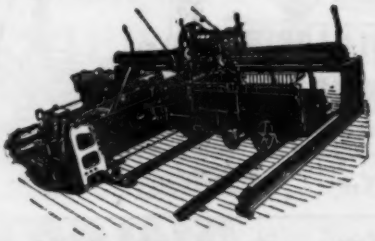

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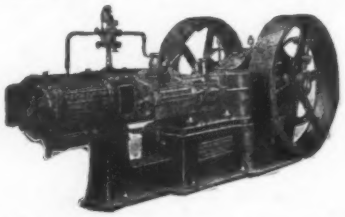

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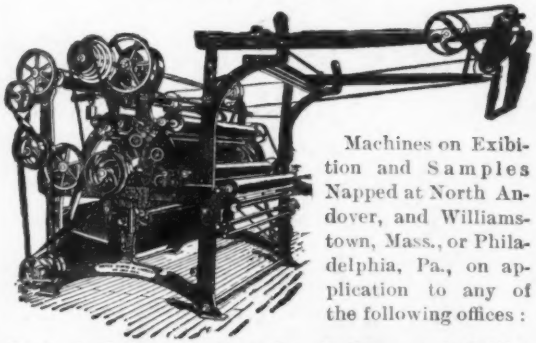

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